

# Plants for People Phase I and II: 2022 Post-Implementation Status Report



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Report for Oregon Watershed Enhancement  
Board (Grant Agreements #214-3054-10944  
and # 217-3037-14328)

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*Institute for Applied Ecology*



## PREFACE

IAE is a non-profit organization whose mission is conservation of native ecosystems through restoration, research and education. IAE provides services to public and private agencies and individuals through development and communication of information on ecosystems, species, and effective management strategies. Restoration of habitats, with a concentration on rare and invasive species, is a primary focus. IAE conducts its work through partnerships with a diverse group of agencies, organizations and the private sector. IAE aims to link its community with native habitats through education and outreach.



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## ACKNOWLEDGMENTS

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**Cover photograph:** A large camas (*Camassia leichtlinii*), which was raised at the Confederated Tribes of Grand Ronde nursery, blooming at Herbert Farm and Natural Area, May 2020 (Photo: Peter Moore).

## SUGGESTED CITATION

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## TABLE OF CONTENTS

<b>PREFACE</b> .....	<b>I</b>
<b>ACKNOWLEDGMENTS</b> .....	<b>II</b>
<b>SUGGESTED CITATION</b> .....	<b>II</b>
<b>TABLE OF CONTENTS</b> .....	<b>III</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>1</b>
<b>1. INTRODUCTION</b> .....	<b>1</b>
1.1. Project goals.....	2
1.2. Project sites.....	2
<b>2. POST-IMPLEMENTATION STATUS AND MEETING OF GOALS</b> .....	<b>10</b>
2.1. Restoration 2020-2022.....	10
2.2. Plant stewardship.....	17
2.3. Plant survival and establishment.....	17
2.2. Integrating cultural connection with restoration.....	23
2.3. Plant production.....	24
2.4. Improve access for traditional harvest.....	27
<b>3. MAINTENANCE OR MODIFICATIONS SINCE PROJECT COMPLETION</b> .....	<b>28</b>
<b>4. PHOTO POINTS</b> .....	<b>28</b>
<b>5. COST ACCOUNTING</b> .....	<b>28</b>
<b>6. PUBLIC AWARENESS</b> .....	<b>28</b>
<b>7. LESSONS LEARNED</b> .....	<b>29</b>
<b>8. REFERENCES</b> .....	<b>30</b>
<b>9. APPENDICES</b> .....	<b>32</b>
Appendix A1. Summary of restoration actions at Herbert Farm and Natural Area (2020-2022).....	32
Appendix A2. Summary of restoration actions at Champoeg State Heritage Area (2020-2022).....	36
Appendix A3. Summary of restoration actions at Confederated Tribes of Grand Ronde project sites (2020-2022).....	32
Appendix B. Plant materials added to Phase II Plants for People project sites (2017-2019).....	33
Appendix C1. Absolute vegetation cover (%) of plant species observed in 5x5m plots at Herbert Farm and Natural Area in 2022.....	40
Appendix C2. Vegetation cover (%) of plants observed in 1x1m plots at Thompson in 2022.....	42
Appendix D. Photo point summary at Plants for People project sites (2013-2022).....	43

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## EXECUTIVE SUMMARY

Phase I and II of the Plants for People project, funded by Oregon Watershed Enhancement Board grant agreements #214-3054-10944 & 11262 and #217-3037-14328, along with other grants and partners, contributed to restoration of 118 acres (2014-2016) and 77 acres (2017-2019) of rare prairie and oak habitat at five sites in the Willamette Valley. Sites included Herbert Farm and Natural Area (City of Corvallis), Champoeg State Heritage Area (Oregon Parks and Recreation Department) and Rattlesnake Butte, South Yamhill and Thompson (Confederated Tribes of Grand Ronde, CTGR). Further restoration and maintenance work at these sites continued in 2020-2022. Restoration actions included broadcast and spot spray herbicide treatments, hand weeding, prescribed burns and mowing to prepare and maintain open meadow and oak habitat for planting and seeding of native species. Generally, native species establishment has been very successful. Plant production fields at multiple nurseries increased the availability of culturally important plants; for example, the CTGR nursery produced 3,418 large camas (*Camassia leichtlinii*) bulbs and 3,047 Gairdner's yampah (*Perideridia gairdneri*) roots for planting at project sites, as well as many plants for other projects. Joint fields were established in partnership with the Willamette Valley Native Plant Partnership and U.S. Fish and Wildlife Service for seed production of barestem biscuitroot (*Lomatium nudicaule*), toughleaf iris (*Iris tenax*) and narrowleaf onion (*Allium amplexans*) and these fields were harvested for seed in 2020-2022. Culturally important plants from the CTGR nursery and other native plants and seed purchased from commercial nurseries were planted at three sites (Herbert Farm and Natural Area, Champoeg State Heritage Area and Thompson). As well as benefiting native habitats, these efforts were designed to help improve tribal access to traditional plant materials. Cultural events, volunteer weeding and planting and nursery tours have all contributed to an increased tribal engagement with restoration sites and culturally important plants and practices.

## 1. INTRODUCTION

The Institute for Applied Ecology (IAE), in collaboration with multiple partners, developed Phase I of the Plants for People project (2014-2016; Oregon Watershed Enhancement Board [OWEB] Grant # 214-3054-10944 [Moore and Neill 2017]; Plant Establishment Grant # 214-3054-11262 [Moore and Neill 2019] and this led to ongoing work during Phase II (2017-2019; Grant # 217-3037-14328 [Moore 2020]).

Phase I of the Plants for People project contributed to restoration and planting at two sites which are historically significant to tribes, Herbert Farm and Natural Area (Herbert Farm) and Champoeg State Heritage Area (Champoeg) (Figure 1). Traditional Ecological Knowledge (TEK) and cultural perspectives were gained through tribal elder visits and cultural events at these areas. To address the lack of culturally important plant materials for restoration, a Tribal Native Plant Materials Program was established at Confederated Tribes of the Grand Ronde (CTGR) by starting a nursery, creating a nursery manager position and writing a development plan to guide production of culturally important plant species (Currin et al. 2016). Production beds for several important plant species were created at CTGR and other nurseries (Moore and Neill 2017, Moore and Neill 2019).

Phase II of the Plants for People project built on the successes of the first phase by expanding nursery production, extending restoration to three CTGR restoration sites (Figure 1) and creating a plan for cultural

harvest at Champoeg (Moore 2020). Subsequent to the completion of Phase II, Phase III of the Plants for People project (OWEB Grant # 221-307-19001) has continued and expanded actions at the five project sites and two additional CTGR restoration sites (Natural Resources Department and Tye Nature Reserve).

This combined report summarizes post-implementation status and activities at the Phase I and Phase II restoration sites and project areas in 2020-2022. This is the final status report for Phase I and first status report for Phase II.

## 1.1. Project goals

The goal of both Plants for People projects was to incorporate TEK, cultural practices and culturally important plants into prairie and oak restoration projects in the Willamette Valley (Figure 1).

Phase I of the project had two primary objectives:

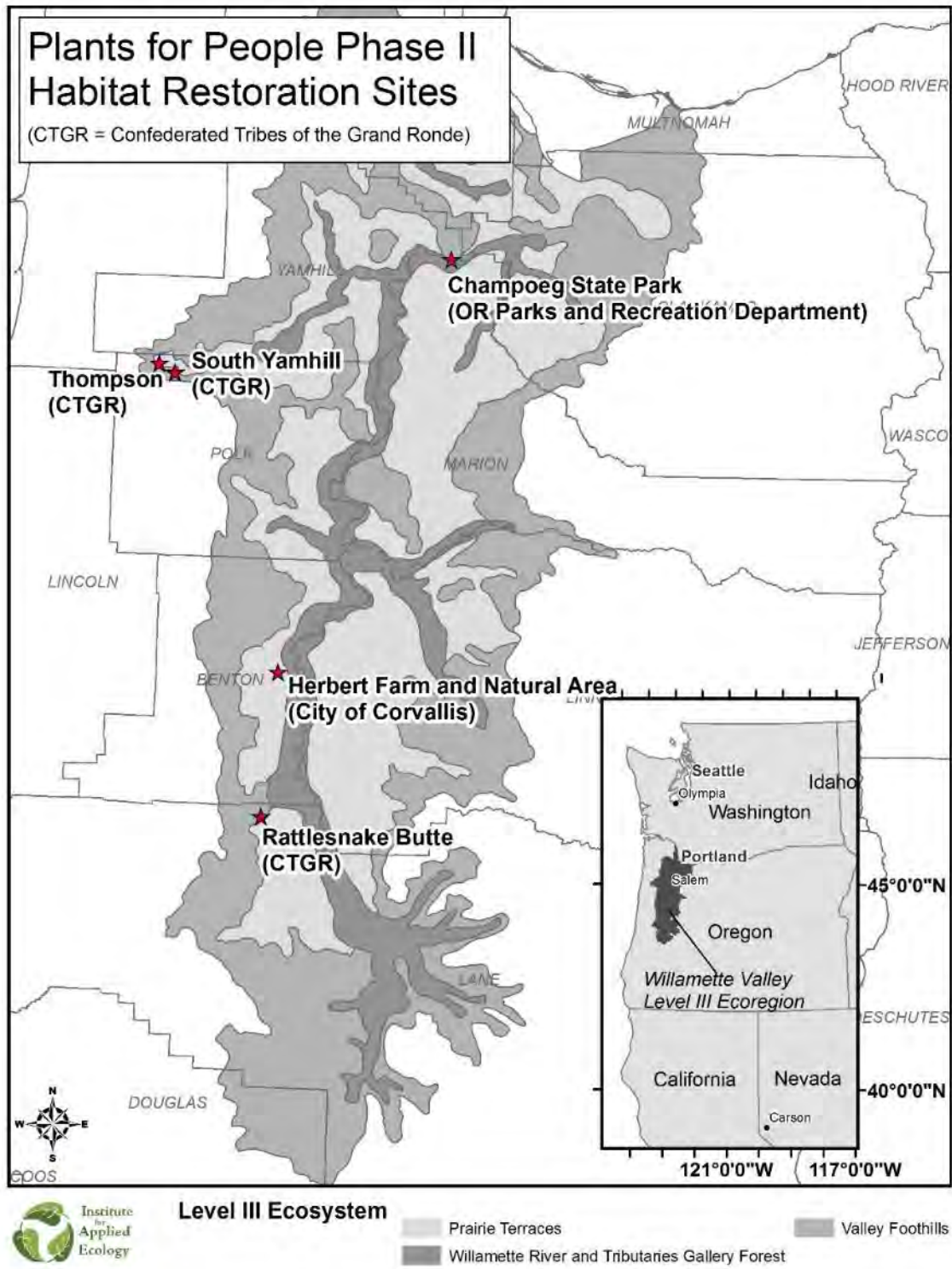
- 1) Restore prairie and riparian plant communities at Champoeg (45 acres) and Herbert Farm (73 acres) for the benefit of watershed health and habitat connectivity, while incorporating traditional ecological knowledge with standard restoration practices.
- 2) Establish a Tribal Native Plant Materials Program at CTGR and introduce cultural plants to project sites in the Willamette Valley for future harvest.

Phase II of the project had four primary objectives:

- 1) Restore diverse, resilient prairie and oak habitat that supports native species (including rare and culturally significant plants, and pollinator and other wildlife resource species) and ecosystem functions at 77 acres at five sites from 2017-2019;
- 2) Incorporate TEK into habitat restoration planning and implementation at project sites, by engaging elders, tribal members and CTGR staff at restoration sites;
- 3) Increase availability of culturally significant plant materials for use in restoration projects and traditional tribal practices through employing nursery staff, growing and purchasing culturally important plant species; and
- 4) Improve access to appropriate sites for traditional gathering and harvest of plant materials by tribal members by developing a traditional harvest plan for Champoeg and establishing future harvest areas at restoration sites.

## 1.2. Project sites

Restoration occurred at Herbert Farm and Champoeg in the Willamette Valley during Phase I of the Plants for People project and expanded to three CTGR sites (Rattlesnake Butte, South Yamhill and Thompson) during Phase II of the project (Figure 1, Table 1). Different project areas were selected at Herbert Farm, and overlapping project areas at Champoeg, during the two phases (Figures 2 and 3).



**Figure 1.** Location of Plants for People project sites in the Willamette Valley.

**Table 1.** Plants for People project sites and restoration acreages.

Site name	Ownership	County	Property acres	Project phase	Number of acres in project				
					Riparian	Oak savanna upland	Wet prairie	Upland prairie	Total
Herbert Farm & Natural Area	City of Corvallis	Benton	221	I	35			38	73
				II	2	3	1	15	21
Champoeg State Heritage Area	Oregon Parks & Recreation Department	Marion	615	I			15	30	45
				II				26.5	26.5
Rattlesnake Butte	CTGR	Lane	276	II		10			10
South Yamhill	CTGR	Polk	136	II		9.5			9.5
Thompson	CTGR	Polk	40	II		9.6			9.6
Total			1288	I	35		15	68	118
				II	2	32.1	1	41.5	76.6

### 1.2.1. Herbert Farm and Natural Area

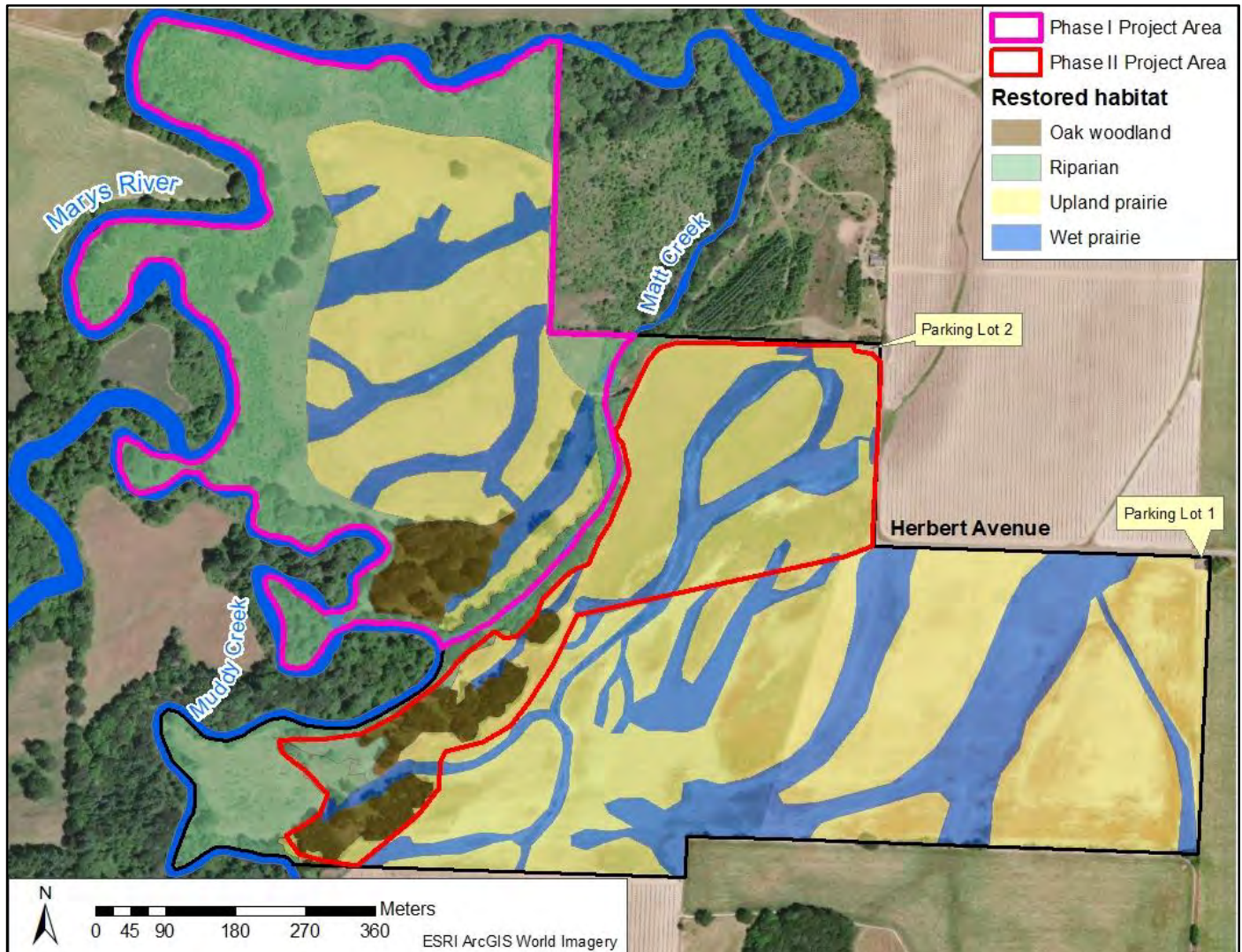
Herbert Farm is a 221-acre property located south of Corvallis in Benton County, Oregon (Figures 1 and 2). Historically, during the last 3,000 years Marys River Kalapuyan people occupied the area for periods in the summer to gather wetland resources such as camas (*Camassia* sp.), wapato (*Sagittaria latifolia*), and cattail (*Typha latifolia*), and probably hunted for waterfowl, fish and game. Open prairie and woodland habitats were actively maintained by the Kalapuya through the use of fire (Applied Ecological Research 2015). Euro-American settlement began around 1847, and thereafter most of the area was farmed (Applied Ecological Research 2015). The property is now owned and administered by the Parks and Recreation Department of City of Corvallis (City) and has a conservation easement with Oregon Department of Fish and Wildlife (ODFW) through the Willamette Wildlife Mitigation Program (WWMP), which in turn is funded by the Bonneville Power Administration (BPA). Within the site, small prairie remnants that were not actively farmed in the past are home to threatened plant species such as Kincaid's lupine (*Lupinus oregonus*) peacock larkspur (*Delphinium pavonaceum*) and Nelson's checkermallow (*Sidalcea nelsoniana*).

Restoration at Herbert Farm is guided by the Herbert Farm and Natural Area Management Plan (City of Corvallis 2011) and two restoration plans (Menke et al. 2013, Moore 2017). Work at this site is supported by multiple grants and in-kind contributions from CTGR, OWEB, U.S. Fish and Wildlife Service (USFWS), the City, ODFW, Center for Natural Resources Management, Sevenoaks Nursery and the Natural Resources Conservation Service's Corvallis Plant Materials Center (PMC). Phase I of the Plants for People project



contributed to prairie and riparian restoration in areas west of Matt Creek (Menke et al. 2013), whereas the Phase II of the project contributed to restoration work in east of Matt Creek (Moore 2017, Moore & Esterson 2022). Restoration in the eastern prairies is focused in part on creating habitat for streaked horned larks (*Eremophila alpestris strigata*), a threatened species which has a large population at the nearby Corvallis Municipal Airport.

The Plants for People Phase I project area included upland prairie and riparian habitats (Table 1, Figure 2), in addition to wet prairie swales and oak woodland habitats. The Phase II project area included 15 acres of upland prairie (within a 25-acre restoration prairie that also includes 10 acres of wet prairie swales), four acres of oak savanna/wet swales (adjacent to five acres of oak woodland) and two acres of riparian plantings (Table 1, Figure 2).



**Figure 2.** Plants for People Phase I and II project areas at Herbert Farm and Natural Area. Shaded polygons indicate restored habitat conditions.

#### **Riparian forest (Phase I: 28 acres)**

After site preparation in 2013-2014, trees and shrubs were planted in 28 acres of riparian habitat in March 2015. Twenty-two acres were planted in high density rows (1900 stems/acre) and seven acres in low density rows (350 stems/acre). The areas were inter-planted in February 2016 with an additional 25% more plants to account for anticipated attrition, with 58,500 trees and shrubs planted over the two years.

### **Upland prairie and wet swales (Phase I: 38 acres)**

After site preparation in 2013-2014, two main seeding events at the Phase I 38-acre restoration prairie occurred in fall of 2014 and 2015, with follow-up seeding in 2016 and 2017. Over 350 pounds of seed comprising 13 species (12 forbs and one grass species), including culturally important species, was broadcast in the first season and 264 pounds and 15 species (10 forbs and five grasses) were drilled in 2015. Native seed was also sown in a 2-acre wet prairie in 2015, and in a 2-acre upland prairie after a prescribed burn in fall 2016. Supplementary bulbs and bare-root plants were planted in multiple years in all restoration units, including 15,230 plants in fall 2016 (Moore and Neill 2017).

### **Woodland (Phase I: 4 acres, map code 3)**

Maintenance activities were largely restricted to spot spraying, semi-annual mowing and girdling of Douglas-fir trees (*Pseudotsuga menziesii*) to prevent the over-topping of Oregon white oaks (*Quercus garryana*).

### **Upland and wet prairies (Phase I: 4 acres)**

After site preparation in 2013-2014, the wet prairie was seeded in 2015 and the upland prairie received a prescribed burn and native seed in 2016. IAE staff spot sprayed encroaching shrubs and trees within the prairie habitat on an annual basis.

### **Upland prairie (Phase II: 15 acres) and wet prairie swale (10 acres)**

After site preparation in 2015-2018, the 25-acre unit was sown with native forbs and Roemer's fescue seed in 2018 and forbs and other native grasses in 2019 to establish upland and wet prairie vegetation (Appendix A).

### **Oak savanna and wet swales (Phase II: 4 acres)**

Site preparation began in fall 2018 and continued through 2019, including broadcast herbicide treatments to create fallow conditions before seeding and planting.

### **Oak woodland (Phase II: 5 acres)**

Previously dominated by Douglas-fir trees, Oregon white oaks were released from competition by felling the Douglas-fir trees in 2018. Some snags were created and other Douglas-fir trees were left intact to create habitat diversity where they weren't competing with oaks.

### **Riparian trees and shrubs (Phase II: 2 acres)**

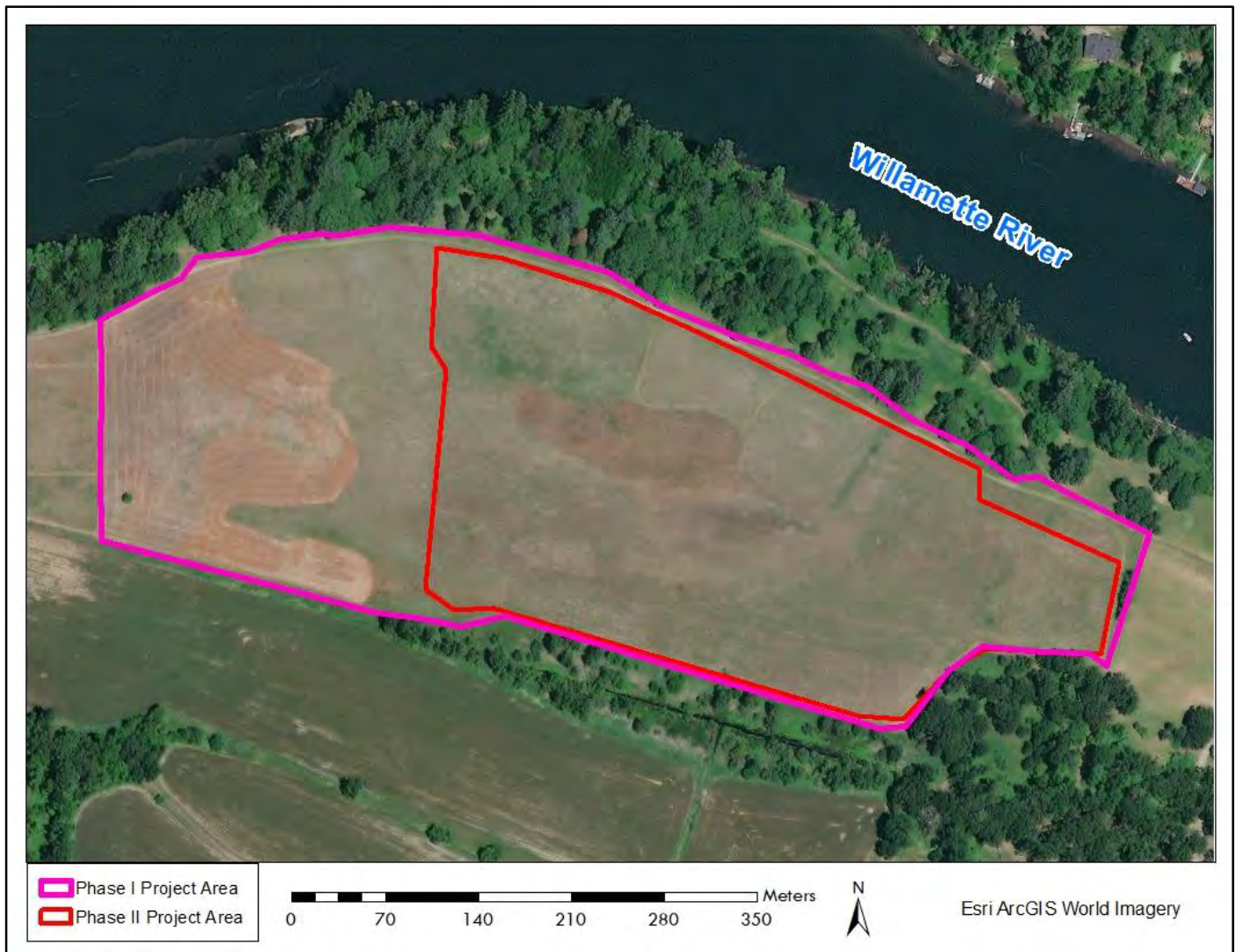
Site preparation began in fall 2018 and continued through 2019, including broadcast herbicide treatments to create fallow conditions before planting.

## **1.2.2. Champoeg State Heritage Area**

Champoeg is a 622-acre property adjacent to the Willamette River, near Newberg in Marion County (Figure 3), and is managed by Oregon Parks and Recreation Department (OPRD). Historically, the area was an important trade, gathering, and food harvesting location for local tribes (Hussey 1967) and open prairie habitats were maintained by periodic intentional fires. The word Champoeg (or Champuik) referred to a hill in the vicinity where native people gathered yampah (*Perideridia oregana* and *P. gairdneri*) roots for food (CTGR 2012, Hussey 1967). Other food and fiber plants that were likely gathered on site include small camas (*Camassia quamash*) and large camas (*C. leichtlinii*), common rush (*Juncus effusus*), hazelnut (*Corylus cornuta*), and many others. During French-Canadian settlement, Champoeg was noted as "the only point between Willamette Falls and Salem where a trail or road could be opened to the river without having to cut through a heavy body of timber" (Hussey 1967). By the early 1840s the town of Champoeg became the focal point for Euro-American settlement and trade and was briefly the State capital, but the settlement was

destroyed by flooding of the Willamette River in 1861 and was never rebuilt. Portions of Champoege Prairie have been farmed since early Euro-American settlement of the area.

Prairie habitat restoration at Champoege began in 2005 when OPRD began to convert a 45-acre agricultural field to native wet and upland prairie. After two years of chemical fallow, the field was seeded with native grasses. By 2013 the prairie was dominated by tufted hairgrass (*Deschampsia cespitosa*) with minor components of blue wildrye (*Elymus glaucus*), Roemer's fescue (*Festuca roemerii*) and California brome (*Bromus carinatus*), but no native forbs. IAE developed a restoration plan (Axt 2014) which has guided restoration actions, such as weed control and introduction of native species diversity (Neill 2019). Phase I of the Plants for People project contributed to prairie restoration of 45 acres during 2014-2016 and Phase II focused on 26.5 acres during 2017-2019 (Table 1, Figure 3).



**Figure 3.** Plants for People Phase I and II project areas at Champoege State Heritage Area.

Forb diversity blocks were established at Champoege in 2014-2015 by reducing the amount of tufted hairgrass using herbicide treatments. Native forb seed was sown in the diversity blocks in 2014 and 2015. A prescribed burn was conducted in 2017 by the CTGR Natural Resources Department fire crew and over 70 pounds of seed, including 13 forbs, one sedge and one rush species, was broadcast over 15 acres, including the forb diversity blocks. Sedge and rush seed was broadcast over a central swale and grass seed was also

broadcast in areas at the west and east ends of Champoeg in 2017 (Appendix B). Further seeding was conducted in 2018 to fill in bare ground exposed by mowing and spot spraying. Bulbs and bare root native plants were planted in fall 2018 and 2019 including plants raised at the Confederated Tribes of Grand Ronde nursery. In 2019, over 5,700 shrubs and trees were planted in high density in a central 2.8-acre area (Appendix B).

Localized weed infestations were targeted with herbicide spray treatments in 2017-2019.

### 1.2.3. Rattlesnake Butte

Rattlesnake Butte is a 276-acre property near Monroe in Lane County, which is owned by CTGR and has a 97-acre conservation easement held by BPA/ODFW through the WWMP. The property is in the foothills of the Coast Range and is comprised of a basalt ridge with south-facing slopes. Shallow dry soils and rock outcrops along the ridge support several rare plant communities, such as the Lemmon's needlegrass (*Achnatherum lemmonii*)/silver moss (*Racomitrium canescens*) plant community and Roemer's fescue grassland, Oregon white oak (*Quercus garryana*) savanna, and species such as the Western rattlesnake (*Crotalus viridis*) (CTGR 2017).

A management plan (CTGR 2017) guides oak and prairie restoration and management at Rattlesnake Butte. Recent restoration of oak woodland and savanna has been supported by USFWS Tribal Wildlife grants. Ten acres of meadow and woodland habitat were chosen to be part of the Phase II project (Table 1, Figure 4).



**Figure 4.** Plants for People project area and photo point locations at Rattlesnake Butte (red polygon). Red dots indicate photo points.

### 1.2.4. South Yamhill

South Yamhill is a 137-acre property located near Grand Ronde and owned by CTGR. Nine acres are designated for conservation with a focus on forest meadow habitat. In 1995, the threatened plant, Nelson's checkermallow, was transplanted to the site as mitigation for construction of the nearby Spirit Mountain

Casino (CTGR 2004). Limited management led to successional establishment of brush and invasive species at the site, but recent actions since 2015, with the support of Natural Resources Conservation Service's (NRCS) Environmental Quality Incentives Program, have opened up meadow habitat. A 9.5-acre area was part of the Phase II project (Table 1, Figure 5).



**Figure 5.** Plants for People project area and photo point locations at South Yamhill (red polygon). Red dots indicate photo point locations.

### 1.2.5. Thompson

Thompson is a 30-acre property located near Grand Ronde and owned by CTGR, with 18 acres designated for conservation of prairie and grassland habitats. Prior to 2015, the site had very limited management, and Scotch broom (*Cytisus scoparius*) and other invasive forbs and grasses became dominant. This site's conservation and restoration is important to the tribal community because of its close proximity to Grand Ronde and utilization by tribal members for plant harvesting. Recent management actions were in part supported by the NRCS Environmental Quality Incentives Program. A 9.6-acre area was part of the Phase II project (Table 1, Figure 6).

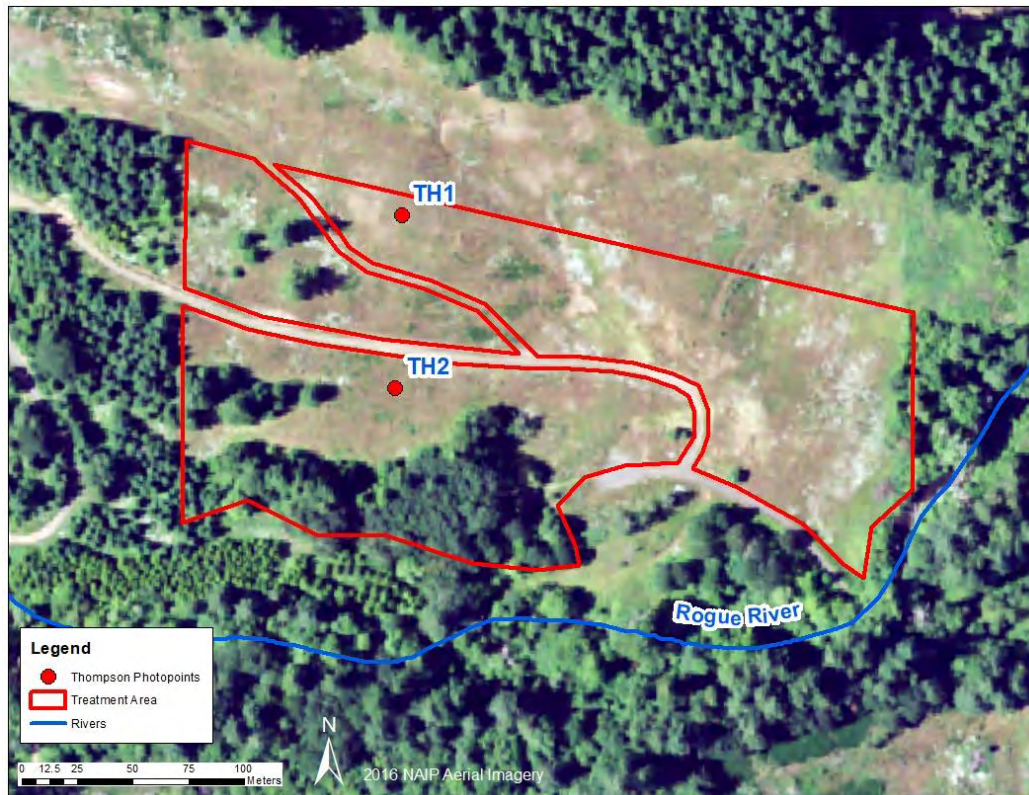
Plot burns were conducted in 2019, followed by seeding and planting.

### 1.2.6. CTGR Nursery

The Natural Resources Department of CTGR is located on a 37.4-acre property located north of Hwy 22 near Grand Ronde, Yamhill County, Oregon. A small nursery was established there in 2014 during Phase I of the Plants for People project, and includes raised beds, ground beds and a greenhouse. A nursery manager was supported with grant funds and the nursery was maintained and expanded during Phase II of the project.

### 1.2.7. IAE Farm

Seed production for culturally-significant prairie forb species occurred at IAE's native plant production fields at the Oregon State University Vegetable Research Farm, near Corvallis, Benton County, Oregon.



**Figure 6.** Plants for People project area and photo point locations at Thompson (red polygon). Red dots indicate photo point locations.

## 2. POST-IMPLEMENTATION STATUS AND MEETING OF GOALS

The primary goals of Phase I and II of the Plants for People project were successfully achieved during 2014-2019 (Moore and Neill 2017, Moore 2020) and continue to be maintained or advanced under the Plants for People III grant (OWEB grant #221-3007-19001). Many of the project elements have had also continued under the auspices of other grants and partner activities, all of which contribute to the ongoing success and meeting of the goals of the project.

### 2.1. Restoration 2020-2022

#### 2.1.1. Herbert Farm and Natural Area

Restoration actions during 2014-2016 in the Phase I project areas at Herbert Farm were summarized in Moore and Neill (2017) and during 2017-2019 for Phase II project areas in Moore (2020). During 2020-2022, Phase I project areas were largely in maintenance mode, with actions including mowing, broadcast and spot spray herbicide treatments and a prescribed burn (Table 2). Phase II project areas were at the site preparation or early plant establishment phases (Table 3). Further detail can also be found for all restoration areas in Appendix A1 and in annual restoration reports for Herbert Farm (e.g., Moore & Esterson 2022).

**Table 2.** Schedule of restoration actions that occurred in the Phase I Plants for People and adjacent project areas at Herbert Farm and Natural Area in 2020-2022.

Year	Month	Riparian forest (28 acres)	Upland prairie and wet swales (38 acres)	Woodland (4 acres)	Wet prairie (2 acres)	Upland prairie (2 acres)
2020	April		Hand weed and weed whack vetch			
	May	Spot spray	Spot spray, Kincaid's lupine & golden paintbrush population survey and veg monitoring			Kincaid's lupine population survey and veg monitoring
	June	Hand mow high density, tractor mow low density plantings, Photo points	Spot spray, Weed whack vetch, Mow perimeter, Photo points		Photo points	Photo points
	August	Partner tour	Partner tour		Spot spray	Spot spray
	October	Spot spray	Mow, Spot spray		Mow	Mow
	2021	May	Spot spray	Spot spray		
June		Hand mow, Photo points	Spot spray, Mow perimeter, Photo points		Photo points	Photo points
July					Prescribed burn planning meeting	Prescribed burn planning meeting
August			Mow		Mow fire line, Spot spray	Mow fire line, Spot spray
September		Spot spray	Spot spray		Re-mow fire line, Prescribed burn, Spot spray	Re-mow fire line, Prescribed burn, Spot spray
October				Mow	Drill and broadcast native seed, Spot spray	Broadcast spray herbicide, Drill and broadcast native seed

Year	Month	Riparian forest (28 acres)	Upland prairie and wet swales (38 acres)	Woodland (4 acres)	Wet prairie (2 acres)	Upland prairie (2 acres)
	November			Girdle Douglas-firs	Plant bare root plants	Plant bare root plants
2022	May	Spot spray	Spot spray, Survey golden paintbrush and peacock larkspur.			Survey golden paintbrush and peacock larkspur.
	June	Hand mow, Photo points	Mow perimeter, Photo points, Survey Kincaid's lupine & Nelson's checkermallow, vegetation plots and weed mapping		Photo points, Survey Nelson's checkermallow, vegetation plots and weed mapping	Photo points, Survey Kincaid's lupine & Nelson's checkermallow, vegetation plots and weed mapping
	August		Mow	Mow	Mow	Mow

### Riparian forest (Phase I: 28 acres)

Due to progress towards closed canopy conditions during 2020-2022, weed control effort continued to decrease in this area compared with previous years. Spot spraying and mowing was limited to areas that have been slower to establish (Table 2, Figure 7).



**Figure 7.** A crew from R. Franco Restoration spot spraying broadleaf weeds in low-density riparian plantings at Herbert Farm and Natural Area (left, May 6, 2021) and a prescribed burn at Herbert Farm and Natural Area (right, September 23, 2021).

### Upland prairie and wet swales (Phase I: 38 acres)

Maintenance activities during 2020-2022 included spot spraying invasive weeds, particularly Canada thistle (*Cirsium arvense*) and common velvetgrass (*Holcus lanatus*), and mowing to reduce the build-up of thatch.



**Woodland (Phase I: 4 acres)**

Maintenance activities included mowing of the open parts of the oak woodland understory to reduce encroachment by shrubs, and girdling of Douglas-fir trees to prevent the over-topping of Oregon white oaks.

**Upland and wet prairies (Phase I: 4 acres)**

IAE staff spot sprayed encroaching shrubs and trees within the prairie habitat during 2020-2022.

On September 23, 2021, the Corvallis Fire Department, with assistance from other agencies, conducted a prescribed burn in four acres of upland and wet prairies (Figure 7). As well as providing ecological benefits, the burn was a training opportunity for fire-fighting staff. Overall, there was good burn coverage, reduction in thatch and exposure of ash-covered soil which created an opportunity for soil contact during re-seeding in October.

**Table 3.** Schedule of restoration actions that occurred in the Phase II Plants for People and adjacent project areas at Herbert Farm and Natural Area in 2020-2022.

Year	Month	Upland prairie (15 acres) and wet swales (10 acres)	Oak savanna/wet swale (4 acres)	Oak woodland (5 acres)	Riparian forest (2 acres)
2020	January				Plant trees and shrubs
	February	Plant bare root seedlings			
	March	Spot spray, Plant Kincaid's lupine			
	April	Plant Kincaid's lupine			
	May	Spot spray			Line and spot spray rows
	June	Spot spray, Broadcast spray swale, Mow berms, photo points	Broadcast spray, Photo points		Hand mow, Photo points
	August	Partner tour			
	October	Broadcast spray fallow areas, Spot spray access road, Drill and broadcast seed, Mow 20 acres, Sow Kincaid's lupine seed	Spot spray, Broadcast spray, No-till drill and broadcast native seed	Spot spray	Spot spray
	November	Plant Nelson's checkermallow and peacock larkspur	Plant camas and yampah		Monitor trees/shrubs
2021	January				Plant trees and shrubs
	March	Spot spray	Spot spray		Spot spray
	April	Spot spray			Spot spray

Year	Month	Upland prairie (15 acres) and wet swales (10 acres)	Oak savanna/wet swale (4 acres)	Oak woodland (5 acres)	Riparian forest (2 acres)
	May	Spot spray		Spot spray	Spot spray
	June	Spot spray, Mow berms, Photo points	Photo points		Hand mow, Photo points
	July	Weed-whack Queen Anne's Lace			
	August	Mow			
	September	Broadcast spray swale	Mow, Broadcast spray reed canarygrass		
	October	Broadcast native forb and grass seed	No-till drill and broadcast native seed		
2022	Apr	Spot spray	Spot spray		Spot spray
	May	Spot spray, Survey peacock larkspur	Spot spray		Spot spray
	Jun	Mow berms, Photo points, Survey Kincaid's lupine & Nelson's checkermallow, vegetation plots and weed mapping			Hand mow, Photo points

### Upland prairie (15 acres) and wet prairie swale (10 acres)

During 2020-2022, regular spot spray treatments were conducted to control invasive broadleaf and grass weeds and annual mowing to reduce thatch (Figure 8, Table 3). One swale became infested with invasive grasses, such as witchgrass (*Panicum capillare*) and barnyardgrass (*Echinochloa crus-galli*), and this was sprayed out in 2020 and 2021 before re-seeding (Table 3). Bare root seedlings of native forbs and plugs or seed of threatened plant species, such as Kincaid's lupine, Nelson's checkermallow and peacock larkspur were planted in spring and fall 2020.

### Oak savanna and wet swales (4 acres)

Broadcast herbicide treatments continued through 2020 before seeding with native forbs and grasses in fall 2020, with follow up weed control and a second seeding of grasses in fall 2021 (Table 3).



**Figure 8.** Francesco Franco and a crew from R. Franco Restoration spot spraying broadleaf weeds in a restoration prairie (left, May 26, 2021) and ODFW staff cleaning the batwing mower during a pause in mowing (right, August 23, 2021).

### **Oak woodland (5 acres)**

Spot spray treatments were conducted in 2020-2022 to control blackberry and hawthorns.

### **Riparian trees and shrubs (2 acres)**

Riparian trees and shrubs were planted in winter 2020 and 2021 (Table 3, Figure 9). These planting areas were maintained with line spraying, spot spraying and hand mowing in 2020-2022 to reduce competition from grasses and weeds. The riparian plantings are still at the early stages of establishment (Figure 9). These latter areas were very weedy in 2021, with an infestation of oxeye daisy (*Leucanthemum vulgare*) and patches of reed canarygrass (*Phalaris arundinacea*), particularly in the low-lying areas. Spray treatments in 2021 reduced the incidence of these species in 2022.



**Figure 9.** Stacy Moore (IAE) planting bare-root trees and shrubs at Herbert Farm and Natural Area (left, January 27, 2021) and 1-2-year old plants after line-spraying and mowing (right, July 13, 2021).

### **2.1.2. Champoege State Heritage Area**

Localized weed infestations were targeted with herbicide spray treatments in 2017-2019 and these continued in 2020-2022 (Appendix A2). High priority weeds, including common mullein (*Verbascum thapsus*), Canada thistle, bull thistle (*Cirsium vulgare*), Himalayan blackberry (*Rubus bifrons*), oxeye daisy, tansy ragwort (*Jacobaea vulgaris*), hairy evening primrose (*Oenothera villosa*), maretail (*Conyza canadensis*), and

non-native grasses, such as rattail fescue (*Vulpia myuros*) and common velvetgrass were targeted for spot-spraying during the project period.

Broadcast herbicide treatments were conducted in a central 2.8-acre sandy area, to target broadleaf weeds and prepare the area for planting shrubs and trees in winters of 2019 and 2020.

Broadcast herbicide applications were made at the west end of the prairie in 2019-2021, in preparation for seeding grasses in 2021. This area was also broadcast sprayed in spring 2022 to control broadleaf weeds and to help with native grass establishment (Appendix A2).

A two-acre area of Champoeg Prairie was designated to become a cultural harvest area where local tribes will eventually be able to gather food and fiber plants. Herbicide use was phased out in this area and several volunteer hand-weeding events were held during 2020-2022 to control invasive species.

### 2.1.3. Rattlesnake Butte

The CTGR silviculture crew removed Douglas-fir trees encroaching within the meadows during 2018-2019 and this work has created more open habitat for the high-elevation meadow (Figure 10).

A CTGR contractor treated tall oatgrass (*Arrhenatherum elatius*) in June 2020 and 2021 by wiping the grass stems with a concentrated glyphosate mix applied with hand-held sponge applicators (Appendix A3). This treatment was designed to reduce invasive grasses within the rare plant community while limiting impacts to the rare Lemon's needlegrass and other native grasses. It was apparent that tall oatgrass has continued to diminish in prevalence in the treatment area since treatments began in 2017.

The Plants for People III project is working on a new 8-acre area of oak savanna habitat at Rattlesnake Butte.



**Figure 10.** Meadow habitat at Rattlesnake Butte, with stumps of Douglas-fir trees (*Pseudotsuga menziesii*) in the foreground (left, May 2022), and a contractor crew spot spraying Scotch broom (*Cytisus scoparius*) at Thompson (right, June 2022).

### 2.1.4. South Yamhill

At South Yamhill, woody brush mowing, mowing and felling of Douglas-fir trees occurred in 2019 to open up meadow habitat that had become overgrown. Spot spray herbicide applications occurred in 2018 and 2019.

During 2020 CTGR mowed the open habitat and sowed grass and forb seed and planted yampah and camas from the CTGR nursery. During 2022, as part of the Plants for People III grant, a spot spray crew targeted blackberry, Scotch broom, Fuller's teasel (*Dispacus fullonum*) and thistles (Appendix A3).

### 2.1.5. Thompson

At Thompson, woody brush mowing by CTGR maintenance staff in 2017 removed the mature Scotch broom infesting the 9.6-acre treatment area and further mowing in 2018 reduced grass thatch. Spot spraying of broadleaf weeds occurred in 2018-2019.

In 2020-2021 the project area was mowed and diversity plots were hand-weeded.

During 2022, as part of the Plants for People III grant, a spot spray crew targeted Scotch broom regrowth (Figure 10, Appendix A3).

## 2.2. Plant stewardship

Native plant materials that were added to project sites during 2017-2019 were summarized in Moore (2020) and Appendix B. Table 4 summarizes the seeding rates (pounds per acre) and densities (seeds per square foot) for the different types of habitat and seed mix. Seeding densities varied from high (75-100 seeds per square foot) for grass cover to low (25-45) for woodland or second year seeding (Table 4).

**Table 4.** Seeding rates at Phase II Plants for People project sites in 2017-2019.

Project area	Habitat	Seed mix type	Seeding	Pounds per acre	Seeds per square foot
Herbert Farm	Upland prairie	Forbs + Roemer's fescue + rush and sedge	1st year	5.9	77
		Forbs + grasses	2nd year	4.5-4.9	25-45
	Wet swales	Forbs	1st and 2nd	1.3-1.6	75-79
	Woodland	Forbs + grasses	1st year	5.7	42
	Riparian	Grasses	1st year	14	75
Champoeg	Upland prairie	Forbs	1st year	4.6	50
	Swales	Carex + rush	1st year	2.4	60
	Upland	Grasses	1st year	18.5	100
Thompson	Upland	Forbs + grasses	1st year	17	75

Many of the weed control efforts outlined in Section 2.1 were designed to improve the success of native species establishment.

More directed stewardship included watering of trees and shrubs. The late-winter and spring months were unusually dry in 2019 at Champoeg. These conditions, combined with warm weather, necessitated watering the newly planted shrubs and trees during May and August of 2019.

## 2.3. Plant survival and establishment

### 2.3.1 Herbert Farm and Natural Area

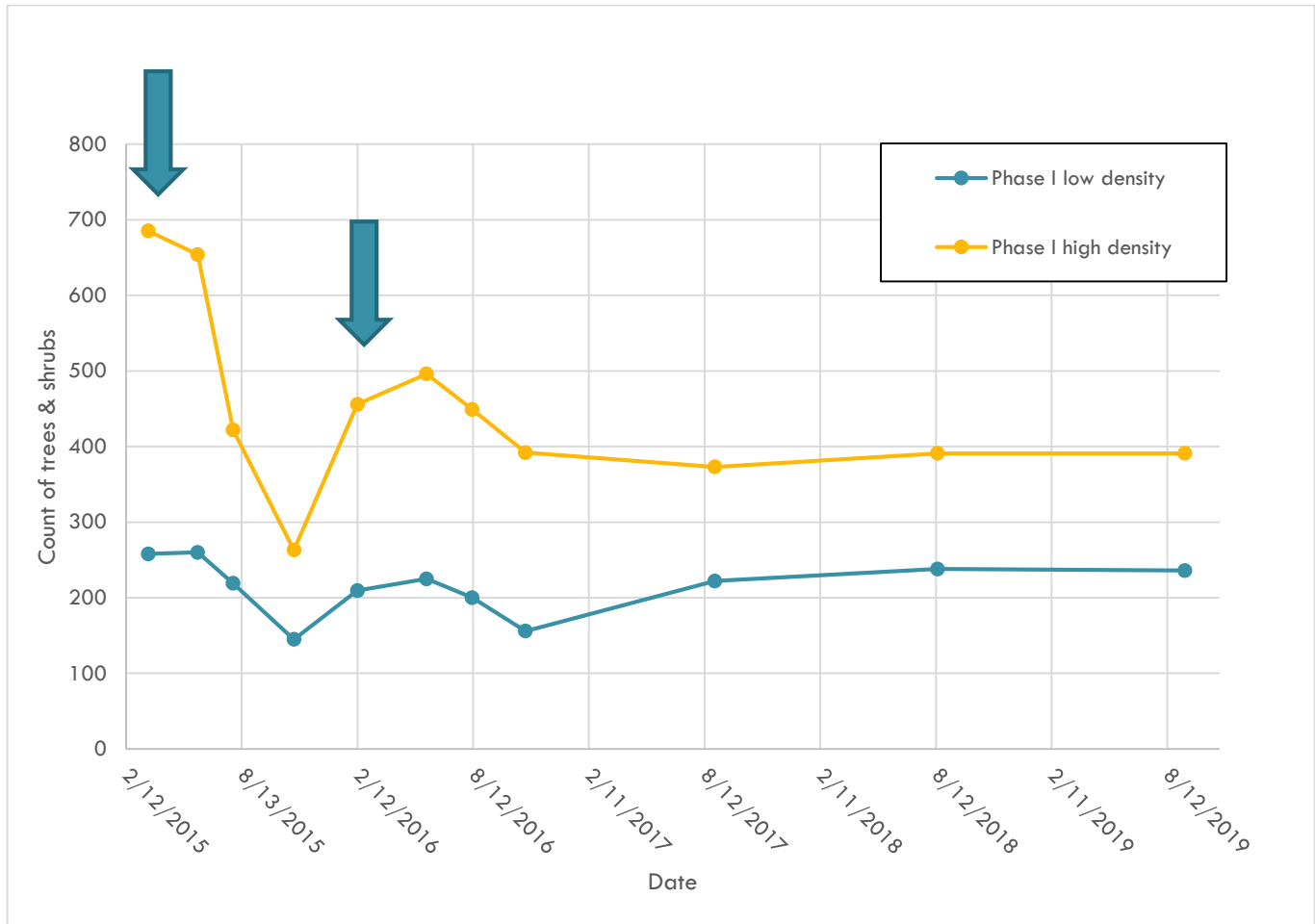
RIPARIAN

Subsequent to planting 28 acres of riparian habitat in 2015-2016 a subsample of surviving trees and shrubs in 17 non-random, variable-length transects was counted (Figure 11). Survival was low (38% in high density and 54% in low density plantings) during the first year because of drought. The additional planting in 2016, coupled with higher survival, resulted in some recovery by 2017-2019 to 57% (high density plantings) and 91% (low density plantings) of the original number planted. The resulting density at two transects in September 2019 was 1402 stems per acre and 314 stems per acre in the two respective planting zones. Since the number of trees and shrubs stabilized in 2017-2019 and counting some species became difficult due to them spreading and developed multiple stems, these transects were not monitored further in 2020-2022 (Figure 11). However, further monitoring of the cover and composition of riparian vegetation in Phase I project areas is planned for 2023 for comparison with data collected in 2013 and 2016 (Menke and Moore 2013, Moore et al. 2017). The ongoing successful establishment and growth of trees and shrubs is apparent in the photograph series taken at photo points since 2013 (e.g., Appendix D: Herbert Farm photo points 6 and 7). Even just comparing the views in 2020 and 2022, there has been a large increase in size and breadth of the trees.

Although the establishment rate varied over the last 6-7 years, some low-lying areas of high-density riparian plantings achieved canopy closure to the extent that they are very difficult to walk through (Figure 12). The tallest trees are black cottonwoods (*Populus balsamifera* ssp. *trichocarpa*), many of which are more than 10 meters tall. Some of the high density plantings on drier uplands were slower to grow initially, but have become well-established in the last few years (e.g., Appendix D: Herbert Farm photo points 8). Low-density plantings, all of which are on drier uplands and include slower growing trees such as Oregon white oak, remain fairly open between rows (Figures 12 and 13). Nevertheless, the increase in height and breadth of trees, such as bigleaf maple (*Acer macrophyllum*), can easily be seen in comparisons of photo points in low density plantings (e.g., Appendix D: Herbert Farm photo points 4, 9 and 10).

A small sample of trees and shrubs (two neighboring rows) that were planted in a 4.5-acre riparian restoration area adjacent to the Phase II project area in February 2017 have been evaluated in subsequent years. The survival during the first growing season (2017) was 90%, likely reflecting the better growing conditions in 2017 than occurred in 2015 at the Phase I project area. Consequently, the inter-planting of 25% more plants in late January 2018, boosted numbers above the original number planted, and have remained high through to 2020 when 85% of the original two cohorts had survived. In 2020 the density in these high-density plantings was 1652 stems per acre, compared with the original planting density of 1485 in 2017.

Overall, the restoration and stewardship activities have been very successful, and the riparian vegetation is gradually maturing and filling in the planting area.



**Figure 11.** Counts of a subsample (combined from 17 transects) of trees and shrub within a 28-acre riparian restoration area, 2015-2019. Blue arrows indicate when the first and second cohorts were planted.



**Figure 12.** Well-established riparian trees and shrubs, 6-7 years after high density planting (left) and more open low-density planting (right, June 1, 2022).



**Figure 13.** An aerial view of Phase I riparian plantings in August 2020, showing greater progression toward canopy closure in low-lying parts of the high-density planting areas to the center-left and wider spacing between rows in the low-density plantings to the right.

#### PRAIRIES

Prairie monitoring in Phase I project areas was conducted in 2013 and 2017 (Menke and Moore 2013, Menke 2017) by sampling 25 plots (2m x 2m) for community composition and cover. Comparable vegetation data was collected in three larger (5m x 5m) plots in Phase I prairies and two plots in Phase II prairies in 2022 and the results are summarized in Table 4 to provide perspective on the progress of restoration. See also Appendix C1.

The newly restored 38-acre prairie increased from zero to 83% native cover in four years, since the former agriculture field was in chemical fallow in 2013, and seeded with native species in the intervening years. Native species continued to predominate with approximately 100% absolute cover in 2022 (Table 5). Initial



establishment of annual native forbs, such as common madia (*Madia elegans*) in 2017 gave way to perennial species such as common woolly sunflower (*Eriophyllum lanatum*, Figure 14). Other common perennial forbs in 2022 included American bird's-foot trefoil (*Acmispon americanum*), slender cinquefoil (*Potentilla gracilis*), dwarf checkerbloom (*Sidalcea malviflora* ssp. *virgata*) and common yarrow (*Achillea millefolium*) and common native grasses included Roemer's fescue and blue wildrye. Introduced grasses included soft brome (*Bromus hordeaceus*), common velvetgrass and rattail fescue (Appendix C1).

**Table 5.** Vegetation cover in monitored plots in Phase I prairies at Herbert Farm in 2013, 2017 and 2022.

Area	Average percent vegetative cover (Absolute*)											
	2013				2017				2022			
	Native	Intro-duced	Shrub /tree	Thatch /litter	Native	Intro-duced	Shrub /tree	Thatch /litter	Native	Intro-duced	Shrub /tree	Thatch /litter
Phase I: Upland prairie and wet swales (38 acres)	0	89.7	0	1	83.2	10.4	0	13.4	11.7	17.7	0	25
Upland (2 acres)	33.4	51.6	9.4	9.8	21.5	66.7	16.1	17	23.8	54.5	3.7	15
Wet prairie (2 acres)	15.3	79.7	1.6	8	47.9	57.1	0	5.6	Not sampled			
Phase II: Upland (15 acres)	Not sampled				Not sampled				115.5	12	0	27.5

\* Absolute cover estimates do not add up to 100% since cover was estimated for individual species which can have overlapping foliage. See Appendix C for individual species data.



**Figure 14.** Showy tarweed (left) was common in restored upland in July 2017, while common woolly sunflower (right) increased its presence in the same area in subsequent years (right, June 4, 2021).

The smaller 2-acre upland has a much lower cover of native species (<25%, Table 5). This area was an existing remnant prairie prior to restoration starting. Because restoration did not start with fallow conditions, a greater component of introduced species has been retained.

The Phase II upland prairie (15 acres) was seeded in 2018-2019 (Appendix B) and the plots surveyed in 2022 had around 100% native cover, including perennial species such as common selfheal, common woolly sunflower, slender cinquefoil, dwarf checkerbloom and Roemer's fescue (Table 5, Appendix C1). Introduced species cover was low and mostly comprised of rattail fescue (Table 5, Appendix C1). This data suggests that with good site preparation, the initial establishment of native vegetation is very high.

The Phase II oak savanna was seeded in 2020 (Appendix B) and this resulted in a dense cover of native grasses at the northern end of the savanna but there was more patchy cover elsewhere (Figure 15). Reed canarygrass re-established in parts of the wet swales, requiring ongoing control. Large camas was flowering in 2021-2022, some of which were planted as bulbs in 2020 (Figure 15).



**Figure 15.** Establishing native grassland (left, April 15, 2021) and flowering large camas (*Camassia leichtlinii* var. *suksdorfii*, right, May 11, 2022) in oak savanna that was seeded and planted in fall 2020.

### 2.3.2. Champoeg State Heritage Area

By 2019-2020, species that had established in the forb diversity blocks included perennials such as common woolly sunflower, common selfheal (*Prunella vulgaris*), common yarrow, barestem biscuitroot (*Lomatium nudicaule*), meadow checkerbloom (*Sidalcea campestris*), dwarf checkerbloom, slender cinquefoil, riverbank lupine (*Lupinus rivularis*) and large camas, as well as annuals such as farewell to spring (*Clarkia amoena*), American bird's-foot trefoil, denseflower willowherb (*Epilobium densiflorum*), common madia and bluehead gilia (*Gilia capitata*) (Figure 16).

Many annual forbs, such as *Madia* species, that were seeded in fall 2017 flowered each subsequent year. Similarly, many species, including large camas, narrowleaf onion (*Allium amplexans*), California compassplant (*Wyethia angustifolia*) and barestem biscuitroot that were hand-planted by volunteers in fall 2018 and 2019 were observed flowering in 2020-2022 (Figure 16).

The trees and shrubs that were planted as part of a Marion Soil and Watershed Council funded project in 2019 was not successful, due to a drought and sandy soil conditions. Approximately 1% of plants survived through to 2022.



**Figure 16.** Common selfheal (*Prunella vulgaris*) and common woolly sunflower (*Eriophyllum lanatum*) that were included in seed mixes are common throughout the prairie at Champoeg (left, June 16, 2021) and the blue flowers of large camas (*Camassia leichtlinii* var. *suksdorfii*) that were planted as bulbs are visible early in the spring (right, May 18, 2022).

### 2.3.3. Thompson

Monitoring of several diversity planting plots in 2022 found that, on average, over 50% of cover was comprised of native species and 34% introduced species (Appendix C2). Common native species include mountain tarweed (*Madia glomerata*), common woolly sunflower, common yarrow, large camas, dwarf checkerbloom, amongst others that were seeded and planted. The main grass component was the introduced colonial bentgrass (*Agrostis capillaris*) and introduced forbs included common sheep sorrel (*Rumex acetosella*), oxeye daisy and Queen Anne's lace (*Daucus carota*).

## 2.2. Integrating cultural connection with restoration

The Plants for People project has helped create a greater connection between tribal members and cultural plants. The CTGR nursery has created a great deal of interest and publicity within the tribe, and by outside groups, as well as through venues such as the Intertribal Nursery Council annual meetings. This comes at a time when CTGR is increasingly becoming a major player in Willamette Valley restoration through purchases and land transfers of natural areas, and a greater focus on restoration in the Natural Resource Department, including the hiring of restoration staff.

In 2018, CTGR, IAE, and OPRD hosted a cultural event to celebrate the establishment of a future cultural harvest area at Champoeg Prairie. Many people attended the event and about 40 volunteers, including tribal members, and agency staff planted 1,300 large camas bulbs and 800 Gairdner's yampah roots in a location where local tribes will eventually be able to collect first foods and share their traditions. In addition to planting, attendees from CTGR and passersby enjoyed cultural demonstrations that included a camas oven, salmon bake, basketry, handmade tools and prairie ecology. During 2020-2022 smaller volunteer planting and hand-weeding events have continued the connection of people to the land at Champoeg. Further events are planned in 2022-2023.

The CTGR nursery hosted many tours and educational experiences for tribal staff, community members and school children as well as a growing number of outside groups (see Section 6). Bulbs and roots were also harvested for propagation at other community gardens and raised beds and first foods celebrations.

Bulbs and roots were harvested from the nursery at Grand Ronde by school children, community members and CTGR staff and planted by IAE volunteers and tribal staff at Herbert Farm, Champoeg, South Yamhill and Thompson, as well as at other restoration sites in the Willamette Valley.

## 2.3. Plant production

The ongoing success of plant production during Phase I and II of the Plants for People project and development of the Tribal Plant Materials Development Plan allowed CTGR to expand the nursery to include a greenhouse and new species for restoration at other CTGR project sites. Plant materials harvested through this program have contributed to cultural events, as well as restoration projects. OWEB funds have been utilized to partially fund a nursery manager, maintain the nursery and expand plant production to new species and this is continuing in Phase III of the project in 2021-2023.

### 2.3.1. CTGR tribal native plant nursery production

Raised beds, seed increase fields and cutting beds that were established at CTGR during the first phase of the Plants for People project in 2014-2016 were maintained through 2022 during subsequent phases of the project (Figure 17, Table 6). Raised beds of large camas and Gairdner's yampah (*Perideridia gairdneri*) produced several thousand bulbs and roots (Table 5) for restoration, cultural and educational purposes. Three shrub species, including Lewis' mock orange (*Philadelphus lewisii*), ocean spray (*Holodiscus discolor*) and Indian plum (*Oemleria cerasiformis*), did not establish well and were replaced with dune willow (*Salix hookeriana*) and rose spirea (*Spiraea douglasii*) (Table 5). In addition, the nursery cultivated 28 other species in pots for a variety of other tribal projects.



**Figure 17.** Large camas (*Camassia leichtlinii*, left), Jeremy Ojua with cow parsnip (*Heracleum maximum*, middle) and Pacific willow (*Salix lucida*, right) at the Confederated Tribes of Grand Ronde native plant nursery (June 2021).

A new bed of fernleaf biscuitroot (*Lomatium dissectum*) was created at the nursery in fall 2018 from seed collected at the Natural Resources Department site and Noble Oaks, another CTGR-owned property located near Grand Ronde. A bed of Virginia strawberry (*Fragaria virginiana*) was established in spring 2019 from plant divisions harvested from the Natural Resources Department and Rogue properties at Grand Ronde and divisions have been harvested for use at restoration sites (Table 6).

In total, 3,418 large camas 3,047 Gairdner's yampah were harvested from the CTGR nursery and used at Plants for People restoration sites. Many of these plant materials were planted at Herbert Farm, Champoeg and Thompson during 2020-2022, in addition to those that were planted in earlier phases of the project (Table 7). Additional bulbs and roots were also transplanted and/or sold by the nursery to other restoration sites in the Willamette Valley. Harvested plant materials were also used for education workshops and transplanting to other raised beds in the Grand Ronde community. Seed was collected and used for

restoration or stored for future restoration projects (Table 6). For example, harvested camas seed was sown at Champoeg after hand-weeding in 2022.

**Table 6.** Plants for People project production fields and harvests during 2020-2021.

Species	Common name	Location	Field or bed type	Size bed	Year established	Status	Harvest	
							2020	2021
<i>Allium amplectens</i>	narrowleaf onion	IAE farm	field	TBD	2020	Current	0	0.89 lb seed
<i>Allium amplectens</i>	narrowleaf onion	CTGR	raised	7.5x5 feet	2014	Current	300 bulbs, 5.2 oz seed	1136 bulbs, 1.8 oz seed
<i>Brodiaea coronaria</i>	crown brodiaea	CTGR	raised	7.5x5 feet	2014	Current	280 bulbs, 4.5 oz seed	2681 bulbs,
<i>Calochortus tolmiei</i>	Tolmie star-tulip	CTGR	raised	7.5x5 feet	2014	Current		
<i>Camassia leichtlinii</i>	large camas	CTGR	raised	60x5 feet	2014	Current	988 bulbs, 14.6 oz seed	2430 bulbs, 38.2 oz seed
<i>Cornus sericea sericea</i>	redosier dogwood	CTGR	cutting	20x5 feet	2014	Current		
<i>Fragaria virginiana</i>	Virginia strawberry	CTGR	field	20x5 feet	2019	Current	100 divisions, 140 containers	
<i>Heracleum lanatum</i>	cow parsnip	CTGR	field	60 feet field	2016	Current	62.6 oz seed	85.3 oz seed
<i>Holodiscus discolor</i>	ocean spray	CTGR	cutting	20x5 feet	2014	Discontinued		
<i>Iris tenax</i>	toughleaf iris	IAE farm	field	0.17 acres	2018	Current	117 lb seed	140.4 lb seed
<i>Lomatium dissectum</i>	fernleaf biscuitroot	CTGR	field	25x5 feet	2018	Current		
<i>Lomatium nudicaule</i>	barestem biscuitroot	IAE farm	field	0.13 acres	2018	Current	153 lb seed	170.5 lb seed
<i>Lomatium nudicaule</i>	barestem biscuitroot	CTGR	raised	7.5x5 feet	2014	Current	30 oz seed	47 oz seed
<i>Madia sativa</i>	coast tarweed	PMC	field	0.2 acre field	2015	Discontinued		
<i>Oemleria cerasiformis</i>	Indian plum	CTGR	cutting	20x5 feet	2014	Discontinued		
<i>Perideridia gairdneri</i>	Gardner's yampah	CTGR	raised	30x5 feet	2014	Current	520 roots	2527 roots, 99.1 oz seed
<i>Philadelphus lewisii</i>	Lewis' mock orange	CTGR	cutting	20x5 feet	2014	Discontinued		
<i>Physocarpus capitatus</i>	Pacific ninebark	CTGR	cutting	20x5 feet	2014	Current		20 cuttings, 458 containers
<i>Salix hookeriana</i>	dune willow	CTGR	cutting	20x5 feet	2017	Current	500 cuttings	200 cuttings
<i>Salix lucida</i>	Pacific willow	CTGR	cutting	20x5 feet	2014	Current	500 cuttings	1200 cuttings
<i>Spiraea douglasii</i>	rose spirea	CTGR	cutting	20x5 feet	2017	Current	100 cuttings	200 cuttings

**Table 7.** Summary of native plant materials planted at Herbert Farm and Natural Area and Champoeg State Heritage Area from 2014-2022.

Restoration area	Type of plant material	Nursery	2014-2016	2017-2019	2020-2022	Total
Herbert Farm	Native seed (pounds)	Commercial	1,175	605	1,344	3,124
	Native plugs & bulbs	Commercial	14,830	18,094	9,126	42,050
	Large camas	CTGR	200	620	400	1,220
	Gairdner's yampah	CTGR	200	500	667	1,367
	Crown brodiaea	CTGR			1,000	1,000
	Trees and shrubs	Commercial	58,509	10,475	4,100	73,084
Champoeg	Native seed (pounds)	Commercial	150	226	196	572
	Native plugs & bulbs	Commercial	34,610	10,100	2,100	46,810
	Large camas	CTGR		800		800
	Gairdner's yampah	CTGR		800	300	1,100
	Narrowleaf onion	CTGR			300	300
	Crown brodiaea	CTGR			325	325
	Trees and shrubs	Commercial		5,702	3,000	8,702

### 2.3.2. Farm production

Seed production for three culturally-significant prairie forb species was initiated at IAE's native plant production fields at Oregon State University Vegetable Research Farm, near Corvallis (Figure 18, Table 5), including:

- Barestem biscuitroot – started as plugs at the Natural Resources Conservation Service's Corvallis Plant Materials Center (PMC) in 2016, during Phase I of the project, and planted at IAE's production fields in 2018. Substantial harvests were obtained in 2020-2021 (Table 6). 2022 harvest data is not yet available.
- Toughleaf iris (*Iris tenax*) – seeds were sown in 10,000 containers and cold-stratified in winter 2017/18, germinated and raised in a greenhouse through 2018, and planted into production fields in fall 2018. Substantial harvests were obtained in 2020-2021 (Table 6).
- Narrowleaf onion – seeds were started in flats in winter 2018/19, and currently, there are 1,200 bulbs growing in the flats, ready for transplanting into a field in fall 2020. A first small harvest was obtained in 2021 (Table 6).

These fields were jointly supported by the Plants for People project, USFWS, the Willamette Valley Native Plant Partnership (WVNPP). CTGR and/or Plants for People project sites will receive a share of harvested seed. To date, a suitable restoration site has not been selected, however IAE is currently partnering with CTGR to restore other CTGR sites for eventual seeding with native prairie species, and these sites are likely candidates for adding the above species.



**Figure 18.** Toughleaf iris (*Iris tenax*, left, April 2021), barestem biscuitroot seed (*Lomatium nudicaule*, middle, August 2021) and narrowleaf onion (*Allium ampletens*, right, June 2022) at the IAE farm.

#### 2.4. Improve access for traditional harvest

The concept of developing better access and harvest opportunities at Champoeg came from the gathering of elders at Champoeg in 2014 during Phase I of Plants for People. This culminated in a draft plan for cultural harvests at Champoeg being prepared as part of Phase II of Plants for People. Preparation of the plan brought tribal and agency staff together to explore options for creating access to a future harvest area within the restored Champoeg Prairie. An initial two-acre area was designated and will be managed to have a higher density of culturally significant plants. Because many of the plants in the harvest area will be food plants, herbicides were phased out in 2018.

Part of the plan for future harvest at Champoeg involves hand-weeding by volunteers to steward the land and combat weeds without the use of herbicides. Starting in 2019 and continuing through 2022, volunteer events were organized by IAE, CTGR and Marion Polk Food Share. Weeds that were targeted included tiny vetch (*Vicia hirsuta*), common mullein, English plantain (*Plantago lanceolata*), thistles and oxeye daisy (Figure 19). Similar stewardship efforts are planned for Thompson and Tye Nature Reserve during 2023.



**Figure 19.** Volunteers and staff from IAE and CTGR at a hand-weeding event at Champoeg State Heritage Area (May 2022).

### 3. MAINTENANCE OR MODIFICATIONS SINCE PROJECT COMPLETION

See section 2.1 and Appendix A for descriptions of restoration and maintenance at the five project sites.

### 4. PHOTO POINTS

Photographs were taken at photo points at the five project sites during 2022 for comparison with pre-restoration and project completion photographs (Appendix D). A full set of photos and their mapped locations are on file at IAE, and available upon request.

### 5. COST ACCOUNTING

Funds used for post-implementation for the phase Plants for People projects are summarized in Table 8.

**Table 8.** Cost accounting post-implementation reporting for Plants for People projects

Grant	Post-implementation Budget	Funds expended on reporting to Aug. 5, 2022
214-3054-10944	\$1,320	\$1,320
217-3037-14328	\$3,054	\$2,423.81

Phase III of the Plants for People project is funded by OWEB (grant #221-3007-19001) and builds on the work achieved during the first two phases. IAE also is conducting ongoing restoration at these sites through grants from ODFW, OPRD, Marion Soil and Water Conservation District and USFWS and in-kind contributions are also provided by these partners, as well as by the City of Corvallis and CTGR. Grant and match funding will be summarized during final reporting for the Phase III project.

### 6. PUBLIC AWARENESS

The nursery and nearby nature trail at CTGR has grown into an educational resource for tribal members and visitors. Jeremy Ojua, the nursery manager, hosted many visits by school children, but during the pandemic these became Zoom presentations, e.g., to Beaverton Grade School and Willamina School District.

Nursery tours also slowed down during the pandemic, but hosted groups during 2021 included Yamhill County Master Gardeners, Ed Groenhout of Chemaw Indian School, Oregon State University (OSU) extension staff and CTGR Youth Education Department summer enrichment program.

Jeremy Ojua was a guest speaker or panelist at several webinars or events, including OSU's screening of the film "Gather" in January 2021, Umatilla riparian webinar, OSU Indigenous Peoples Workgroup and the Indigenous Seed Saving Workshop in February 2021, Indigenous and Traditional Soil Health Practices Workshop in March 2021, Advanced Agriculture Ethnobotany high school class, Wisdom of the Elders interns and Portland State University Indigenous Studies, Portland Bureau of Environmental Services in April 2021, Mt Hebo field trip for Willamina school district and Artemisia douglasiana gathering trip at Minto Brown Park, Salem in June 2021 and the North American Forest and Conservation Nursery Technology Webinar Series in August 2021.

Jeremy Ojua also assisted other CTGR departments to create raised beds for propagation of first foods and culturally important plant species and provided seed packets educational take home activity boxes for tribal



youth in August 2021, for the CTGR Community Drive in October 2021 and tribal youth projects in November 2021.

Jeremy Ojua, Lindsay McClary and Greg Archuleta contributed to Traditional Ecological Knowledge videos for Polk Soil and Water Conservation District in 2021: [Traditional Ecological Knowledge \(TEK\) Concepts - YouTube](#); [Practical TEK - YouTube](#).

The nursery was featured in a newsletter article by the Bonneville Environmental Foundation. "How the Confederated Tribes of Grand Ronde built a nursery that supports land and community. A conversation with Jeremy Ojua, Lindsay McClary and Kayla Seaforth." Treeline Newsletter (Bonneville Environmental Foundation), December 2021. [https://www.b-e-f.org/wp-content/uploads/2021/12/Treeline\\_December-2021newsletter.pdf](https://www.b-e-f.org/wp-content/uploads/2021/12/Treeline_December-2021newsletter.pdf).

Lindsay McClary gave a presentation on the CTGR tribal native plant nursery to the Native Plant Materials Virtual Conference on January 12, 2022.

## 7. LESSONS LEARNED

The Plants for People project contributed greatly to restoration at Herbert Farm, Champoeg, Rattlesnake Butte, South Yamhill and Thompson. Without the restoration services and addition of plant materials that the grants provided, the success of native plant establishment and diversity would not have been possible. The restoration grants also helped to leverage a significant amount of matching activity from partnering agencies. These restoration areas are contributing to ecosystem function and connectivity in their respective watersheds.

Monitoring of plant establishment indicates that, generally, the survival and establishment of native species has been very high. This indicates that the techniques for site preparation and management of the planting areas have been successful. The exception occurred with an area of Champoeg that was planted with trees and shrubs - very few plants survived due to a drought and sandy soil conditions.

In recent years, CTGR has become a major natural areas land manager and contributor to the protection of prairie and oak habitats in the Willamette Valley through purchase and acquisition of new properties and securing funding and resources to implement restoration on its lands. The Plants for People project supported CTGR efforts to strengthen its restoration and plant production focus. Other mutually beneficial partnerships were established or deepened as a result of this project, including partnerships between CTGR and public land managers engaged in restoration such as OPRD.

Partially supporting the nursery at CTGR helped to continue the development of a tribal plant materials program at CTGR which has grown in recent years. The Tribal Native Plant Materials Development Plan provided the basis for buy-in from the Tribal Council, through the approval of the plan, and set the expansion of the nursery into motion through other grants from CTGR and the support from OWEB. The nursery is on a good path to sustainability through access to other funding and recovering some of its costs through sale of plant materials.

An unexpected benefit of the nursery has been the educational aspect, with school children learning about cultural plants and, along with community members helping to harvest plants for restoration. The nursery has attracted a lot of interest both within and outside the tribe and the expertise of nursery staff is being utilized by many groups within Oregon and nationally.

Visits by tribal elders, cultural events and the draft harvesting plan for Champoeg have provided the tribal community with a renewed connection to the heritage area and the restoration of cultural plants to the

prairie. With time, it is hoped that harvest of native plants can resume. There is also great interest in developing harvest opportunities on tribal land where access is less limited.

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## 9. APPENDICES

**Appendix A1. Summary of restoration actions at Herbert Farm and Natural Area (2020-2022)**

Year	Habitat type	Acres	IAE/Contractor	City/Contractor	USFWS	ODFW	Description
2020	Riparian forest	28	X				Ongoing spot spraying maintenance of riparian plantings in May and mowing in June. Other spot spray in October. A partner tour of all areas was held in August.
2020	Upland prairie and wet prairie swales	38	X			X	Golden paintbrush and Kincaid's lupine populations were surveyed in May. Infestation of vetch hand weeded or weed-whacked near these rare species. Spot spray treatments in May-June and October. Perimeter was mowed in June and whole prairie in October.
2020	Wet prairie	2	X	X		X	Prescribed burn planning meeting held in August but burn was deferred to 2021. Spot spray treatments in August targeted reed canarygrass, thistles and encroaching shrub and tree seedlings. Mowed in October.
2020	Upland prairie	2	X			X	Golden paintbrush and Kincaid's lupine were surveyed in May. Spot spray treatments in August targeted shrub and tree seedlings. Mowed in October.
2020	Upland prairie and wet prairie swales	25	X		X	X	Two broadcast herbicide treatments (Rodeo) in one swale and a fallow area near road in June and October. Spot spraying broadleaf weeds in March, May, June, September and October. Mow berms in June and 20 acres in October. Native seed mixes were drilled or broadcast seeded over 5 acres in October. Kincaid's lupine seed was sown in October. Bare root native plants were planted in February, Kincaid's lupine plugs planted in March-April, and Nelson's

Year	Habitat type	Acres	IAE/Contractor	City/Contractor	USFWS	ODFW	Description
							checkermallow and peacock larkspur were planted in November.
2020	Riparian forest	2	X				Plant trees and shrubs in new area. Line spray and spot spraying in May and mowing maintenance of riparian plantings in June. Further spot spray around perimeter in October.
2020	Oak woodland	5	X				Limited spot spraying of blackberry in October.
2020	Oak savanna	4	X		X		Broadcast spray (Rodeo) in June and October. Spot spray in October. Native forb and grass seed was drilled and broadcast in October.
2021	Riparian forest	28	X				Ongoing spot spraying maintenance of riparian plantings in May and limited mowing in June. Other spot spray in September.
2021	Upland prairie and wet prairie swales	38	X			X	Spot spray treatments in May-June and September. Perimeter was mowed in June and the whole prairie in October.
2021	Oak woodland	4		X			Mowed in November to control shrub encroachment of open areas and camas field. 6 Douglas-fir trees re-girdled and 8 more girdled to release oaks.

## Plants for People Phase I &amp; II: 2022 Post-Implementation Report

Year	Habitat type	Acres	IAE/Contractor	City/Contractor	USFWS	ODFW	Description
2021	Wet prairie	2	X	X		X	Spot spray treatments in August targeted reed canarygrass, thistles and encroaching shrub and tree seedlings. A fire line was mowed and a prescribed burn was conducted in September. Native forbs and grasses were sown with no-till drill and additional grasses hand broadcast in October. Camas and other bulb species were planted in November.
2021	Upland prairie	2	X	X		X	Spot spray treatments in August-September targeted shrub and tree seedlings. A fire line was mowed and a prescribed burn was conducted in September. Post-burn glyphosate spray of upland. Native forbs and grasses were sown with no-till drill and additional grasses hand broadcast in October. Brodiaea bulbs and yampah roots were planted in November.
2021	Upland prairie and wet prairie swales	25	X		X	X	Spot spray periphery in March. Two broadcast herbicide treatments (Rodeo) in one swale in June and October. Spot spraying broadleaf weeds in May and grasses in June. Mow berms in June and 20 acres in September. Native seed was broadcast by hand and ATV over 5 acres in October.
2021	Riparian forest	2	X				Interplanting of trees and shrubs in January in new 2.1-acre riparian restoration area in January. Spot spraying of oxeye daisy in March. Line spray and spot spraying in May and mowing maintenance of riparian plantings in June.
2021	Oak savanna	4	X	X	X		Spot spray in March. Broadcast spray patches of reed canarygrass in September. Mowed in September. Grass seed was drilled in October.

Plants for People Phase I & II: 2022 Post-Implementation Report

Year	Habitat type	Acres	IAE/Contractor	City/Contractor	USFWS	ODFW	Description
2022	Riparian forest	28	X				Ongoing spot spraying maintenance of riparian plantings in May and limited mowing in June.
2022	Upland prairie and wet prairie swales	38	X	X		X	Spot spray treatments in May. Perimeter was mowed in June. HCP area was surveyed for threatened plant species, vegetation plots and weed mapping in May-June. Mowed in August
2022	Oak woodland	4		X			Mowed in August.
2022	Wet prairie	2	X	X			HCP area was surveyed for threatened plant species, vegetation plots and weed mapping in May-June. Mowed in August.
2022	Upland prairie	2	X	X			HCP area was surveyed for threatened plant species, vegetation plots and weed mapping in May-June. Mowed in August.
2022	Upland prairie and wet prairie swales	25	X	X			Spot spray periphery in April. Spot spray broadleaf weeds and grasses in May. Mow berms and access road in June. HCP area was surveyed for threatened plant species, vegetation plots and weed mapping in May-June.
2022	Riparian forest	2	X				Line spray and spot spraying in May and mowing maintenance of riparian plantings in June.
2022	Oak savanna	4	X				Spot spray in April and May.

## Appendix A2. Summary of restoration actions at Champoeg State Heritage Area (2020-2022)

Date	Activity	Description
2/13/2020	Planting	R. Franco Restoration planted 3000 bare root trees from Scholls Valley Native Nursery and shrubs and 133 containerized plants from NORP Nursery in Tillamook.
3/11/2020	Spot spray	Rolando spot sprayed west end of prairie with glyphosate to target any regrowth in the fallow treatment area.
6/16/2020	Photo points	Repeat photo points and direct volunteer where to collect camas later in the year.
6/24/2020	Broadcast herbicide treatment	Habitat Restoration subcontractor broadcast sprayed Opensight to western 11 acres to create fallow conditions in preparation for seeding in fall 2021.
8/2/2020	Watering	Rolando watered trees and shrubs using the OPRD hose and tank.
8/3/2020	Watering	Rolando watered trees and shrubs using the OPRD hose and tank.
5/1/2021	Broadcast herbicide treatment	Habitat Restoration subcontractor broadcast sprayed Rodeo/Escort to western 14 acres to create fallow conditions in preparation for seeding in fall 2021.
9/27/2021	Hand weeding	19 student volunteers and staff pulled and bagged weeds in and around the future harvest area.
11/20/2021	Planting	Planted 1,100 <i>Camassia quamash</i> purchased from Seven Oaks and 300 <i>Perideridia gairdneri</i> , 325 <i>Brodiaea coronaria</i> , and 300 <i>Allium amplexans</i> purchased from CTGR. Hand broadcast 7 oz of <i>Camassia quamash</i> seed to disturbed areas during planting with volunteers. In addition to the <i>Camassia quamash</i> , Seven Oaks donated ~1,000 <i>Triteleia hyacinthina</i> bulbs to the project that were planted the same day. Some volunteers also hand weeded the area removing some oxeye daisy, tansy ragwort, thistles and mullein.
12/7/2021	Broadcast herbicide treatment	Subcontractor broadcast glyphosate to 10 acres of fallow for a final treatment before broadcast seeding with native grass mix.
12/14/2021	Seeding	196 pounds of native seed (including Alaska brome, California oatgrass, blue wildrye and Roemer's fescue) was hand broadcast on the 11-acre treatment area at a rate of 17.82 lbs/acre.
5/7/2022	Hand weeding	9 volunteers, 2 IAE staff and 1 CTGR staff hand weeded Canada thistle, bull thistle, tansy ragwort and oxeye daisy and spread camas seed in disturbed areas. P4P photo points were repeated.



Plants for People Phase I & II: 2022 Post-Implementation Report

Date	Activity	Description
5/31/2022	Spot spray	IAE staff spot sprayed central shrub area with glyphosate to target mullein and western area to target Canada thistle.
5/31/2022	Broadcast herbicide treatment	Subcontractor broadcast triclopyr to target broadleaf weeds and allow native grasses to establish.
6/26/2022	Hand weeding	5 volunteers, 2 IAE staff and 1 CTGR staff hand weeded oxeye daisy.

### Appendix A3. Summary of restoration actions at Confederated Tribes of Grand Ronde project sites (2020-2022)

Date	Area	Acres	IAE/Contractor	CTGR/Contractor	Description
Jun-20	Rattlesnake Butte	10		X	Tall oatgrass control - weed wiping with glyphosate
Jun-21	Rattlesnake Butte	10		X	Tall oatgrass control - weed wiping with glyphosate
Jun-21	Rattlesnake Butte		X		Repeat photo points
Jun-22	Rattlesnake Butte		X		Repeat photo points
Spring 2020	South Yamhill	10		X	Mowed prairie habitat.
Fall 2020	South Yamhill	10		X	Sowed grass and forb seed in areas of limited vegetation, and yampah roots and camas bulbs from the CTGR nursery, as part of the NRCS grant/planting plan.
6/22/2021	South Yamhill	10	X		Repeat photo points, assess weed issues, discuss treatments.
6/9/2022	South Yamhill	10	X		R. Franco Restoration crew spot sprayed broadleaf weeds and shrubs (Scotch broom, blackberry, hawthorn) with Vastlan (triclopyr).
6/9/2022	South Yamhill	10	X		Repeated photo points
fall 2020	Thompson	10		X	Mowed all prairie habitat.
6/22/2021	Thompson		X	X	Repeat photo points, assess weed issues, discuss treatments.
summer 2021	Thompson	1		X	Maintenance of diversity plots by weed-eating and hand weeding.
6/9/2022	Thompson	10	X		R. Franco Restoration crew spot sprayed broadleaf weeds and shrubs (Scotch broom, blackberry, hawthorn) with Vastlan (triclopyr).
6/9/2022	Thompson		X		Repeated photo points

## Appendix B. Plant materials added to Phase II Plants for People project sites (2017-2019)

**Table B1.** Native plants seeded at Herbert Farm and Natural Area in September-October 2018.

Scientific name	Common name	Duration	Form	Pounds/acre		
				Upland 15 acres	Wet swales 10 acres	Woodland 6 acres
<i>Acmispon americanum</i>	American bird's-foot trefoil	annual	forb	0.19		
<i>Aquilegia formosa</i>	western columbine	perennial	forb			0.3
<i>Bromus sitchensis</i>	Alaska brome	perennial	grass			3.3
<i>Camassia quamash</i>	small camas	perennial	forb	0.13	0.30	
<i>Carex tumulicola</i>	splitawn sedge	perennial	sedge	0.18		
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell to spring	annual	forb	0.15		
<i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>	winecup clarkia	annual	forb	0.16		
<i>Collinsia grandiflora</i>	giant blue eyed Mary	annual	forb	0.17		
<i>Downingia elegans</i>	elegant calicoflower	annual	forb		0.34	
<i>Elymus glaucus</i>	blue wildrye	perennial	grass			1.5
<i>Eriophyllum lanatum</i>	common woolly sunflower	perennial	forb	0.21		
<i>Festuca roemerii</i>	Roemer's fescue	perennial	grass	1.96		0.4
<i>Iris tenax</i>	toughleaf iris	perennial	forb	0.92		
<i>Juncus bufonius</i>	toad rush	annual	rush	0.02	0.05	
<i>Leptosiphon bicolor</i>	true babystars	annual	forb	0.08		
<i>Lupinus polycarpus</i>	smallflower lupine	annual	forb	0.27		
<i>Luzula comosa</i>	Pacific woodrush	perennial	forb	0.13		
<i>Madia elegans</i>	common madia	annual	forb			0.2
<i>Microsteris gracilis</i>	slender phlox	annual	forb	0.11	0.40	
<i>Mimulus guttatus</i>	seep monkeyflower	perennial	forb		0.02	
<i>Perideridia oregana</i>	Oregon yampah	perennial	forb	0.07		
<i>Plagiobothrys figuratus</i>	fragrant popcornflower	annual	forb		0.09	
<i>Plectritis congesta</i>	shortspur seablush	annual	forb	0.23		
<i>Potentilla gracilis</i>	slender cinquefoil	perennial	forb	0.13		
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	lance selfheal	perennial	forb	0.10		
<i>Ranunculus occidentalis</i>	western buttercup	perennial	forb	0.10		
<i>Ranunculus orthorhynchus</i>	straightbeak buttercup	perennial	forb	0.10		
<i>Sidalcea malviflora</i> ssp. <i>virgata</i>	dwarf checkerbloom	perennial	forb	0.30		
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass	perennial	forb	0.20		
<i>Veronica peregrina</i> var. <i>xalapensis</i>	Hairy purslane speedwell	annual	forb		0.10	

<b>Total pound per acre</b>	<b>5.9</b>	<b>1.3</b>	<b>5.7</b>
<b>Total pounds</b>	<b>88.6</b>	<b>12.9</b>	<b>86.8</b>

**Table B2.** Native plants seeded at Herbert Farm and Natural Area in September-October 2019.

Scientific name	Common name	Duration	Form	Pounds/acre			
				Upland prairie 6 acres	Upland prairie 9.5 acres	Wet swales 5.5 acres	Ground cover 2 acres
<i>Acmispon americanus</i>	American bird's-foot trefoil	annual	forb	0.14			
<i>Achillea millefolium</i>	common yarrow	perennial	forb	0.04			
<i>Agrostis exarata</i>	spike bentgrass	perennial	grass				0.06
<i>Allium amplexans</i>	narrow-leaf onion	perennial	forb	0.11			
<i>Alopecurus geniculatus</i>	water foxtail	perennial	grass			1.08	
<i>Beckmannia syzigachne</i>	American sloughgrass	perennial	grass				0.61
<i>Bromus sitchensis</i>	Alaska brome	perennial	grass				4.60
<i>Camassia quamash</i>	common camas	perennial	forb	0.20			
<i>Carex tumulicola</i>	splitawn sedge	perennial	sedge				0.50
<i>Carex unilateralis</i>	one-sided sedge	perennial	sedge				0.17
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring	annual	forb	0.10			
<i>Collinsia grandiflora</i>	large-flowered blue-eyed Mary	annual	forb	0.04	0.11		
<i>Danthonia californica</i>	California oatgrass	perennial	grass	1.97	2.59		2.33
<i>Deschampsia cespitosa</i>	tufted hairgrass	perennial	grass				0.22
<i>Downingia elegans</i>	elegant calicoflower	annual	forb	0.05		0.16	
<i>Eriophyllum lanatum</i>	woolly sunflower	perennial	forb	0.05	0.12		
<i>Eleocharis ovata</i>	ovoid spikerush	perennial	sedge	0.10		0.12	
<i>Elymus glaucus</i>	blue wildrye	perennial	grass				2.72
<i>Festuca roemerii</i>	Roemer's fescue	perennial	grass				0.65
<i>Hordeum brachyantherum</i>	meadow barley	perennial	grass				2.18
<i>Iris tenax</i>	toughleaf iris	perennial	forb	0.43	0.71		
<i>Juncus bufonius</i>	toad rush	annual	rush	0.01		0.05	0.02
<i>Leptosiphon bicolor</i>	true babystars	annual	forb	0.04	0.004		
<i>Lupinus polycarpus</i>	small-flowered lupine	annual	forb		0.40		
<i>Microsteris gracilis</i>	slender phlox	annual	forb	0.02		0.05	
<i>Mimulus guttatus</i>	common monkeyflower	perennial	forb	0.004		0.01	
<i>Perideridia oregana</i>	Oregon yampah	perennial	forb	0.08	0.09		
<i>Plagiobothrys figuratus</i>	fragrant popcornflower	annual	forb	0.13		0.08	
<i>Plectritis congesta</i>	shortspur seablush	annual	forb	0.14	0.08		
<i>Potentilla gracilis</i>	slender cinquefoil	perennial	forb	0.13	0.08		
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	perennial	forb	0.05	0.17		
<i>Ranunculus occidentalis</i>	western buttercup	perennial	forb	0.10	0.11		

Plants for People Phase I & II: 2022 Post-Implementation Report

<i>Ranunculus orthorhynchus</i>	straightbeak buttercup	perennial	forb	0.14	0.15		
<i>Sidalcea malviflora</i> ssp. <i>Virgata</i>	dwarf checkermallow	perennial	forb	0.30	0.10		
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass	perennial	forb	0.11	0.23		
<i>Veronica peregrina</i> var. <i>xalapensis</i>	hairy purselane speedwell	annual	forb	0.01		0.05	
<b>Total pounds per acre</b>				<b>4.5</b>	<b>4.9</b>	<b>1.6</b>	<b>14.1</b>
<b>Total pounds</b>				<b>27.3</b>	<b>49.5</b>	<b>12</b>	<b>28</b>

**Table B3.** Native forbs, sedges and rushes planted at Herbert Farm in November 2017 and 2018, October-November 2019 and February 2020.

Scientific name	Common name	Type	Number of plants per year			
			2017	2018	2019	2020
<i>Allium amplexans</i>	narrowleaf onion	bulb	60	400	400	
<i>Asclepias speciosum</i>	showy milkweed	plug	394			
<i>Brodiaea elegans</i>	elegant brodiaea	bulb	130	500	900	
<i>Calochortus tolmiei</i>	Tolmie's star-tulip	bulb		470	800	
<i>Camassia leichtlinii</i> var. <i>suksdorfii</i>	large camas	bulb	1177	300	500	
<i>Camassia quamash</i>	common camas	bulb		400	500	
<i>Carex densa</i>	dense sedge	plug		500	400	
<i>Delphinium pavonaceum</i>	peacock larkspur	crown				
<i>Dichelostemma congesta</i>	ookow	bulb			1000	
<i>Fragaria vesca</i>	woodland strawberry	bareroot			50	
<i>Fragaria virginiana</i>	wild strawberry	bareroot		500	500	
<i>Geranium oregonum</i>	western geranium	crown		500	100	1500
<i>Iris tenax</i>	toughleaf iris	bareroot		600	1000	
<i>Juncus effusus</i>	common rush	division		500	200	
<i>Juncus patens</i>	spreading rush	division		500	200	
<i>Lomatium nudicaule</i>	barestem biscuitroot	tuber		400	400	
<i>Perideridia gairdneri</i> ssp. <i>borealis</i>	Gairdner's yampah	bareroot	200	300	0	
<i>Ranunculus occidentalis</i>	western buttercup	bareroot		346	300	
<i>Sidalcea malviflora</i> ssp. <i>virgata</i>	dwarf checkerbloom	bareroot			0	1500
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass	bareroot		500	700	
<i>Thalictrum polycarpum</i>	tall meadow-rue	crown		300	0	
<i>Triteleia hyacinthina</i>	hyacinth brodiaea	bulb		400	1300	
<i>Wyethia angustifolia</i>	California compassplant	crown		400	100	
<b>Total</b>			<b>1961</b>	<b>7816</b>	<b>9350</b>	<b>3000</b>

**Table B4.** Native seed broadcast at Champoeg State Heritage Area in fall 2017.

Scientific name	Common name	Pounds/acre
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## Plants for People Phase I &amp; II: 2022 Post-Implementation Report

		<b>Upland 15.3 acres</b>	<b>Swale 2 acres</b>	<b>Grass 5.9 acres</b>
<i>Achnatherum lemmonii</i>	Lemmon's needlegrass			2.53
<i>Carex densa</i>	dense sedge		0.19	
<i>Carex pachystachya</i>	chamisso sedge		0.41	
<i>Carex scoparia</i>	broom sedge		0.28	
<i>Carex stipata</i>	awlfruit sedge		0.69	
<i>Carex unilateralis</i>	lateral sedge	0.22	0.45	
<i>Clarkia amoena</i>	farewell to spring	0.10		
<i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>	winecup clarkia	0.13		
<i>Danthonia californica</i>	California oatgrass			1.86
<i>Eleocharis palustris</i>	creeping spikerush		0.38	
<i>Elymus glaucus</i>	blue wildrye			8.39
<i>Epilobium densiflorum</i>	denseflower willowherb	0.31		
<i>Eriophyllum lanatum</i>	Common woolly sunflower	0.23		
<i>Festuca roemerii</i>	Roemer's fescue			5.74
<i>Grindelia integrifolia</i>	Puget Sound gumweed	1.42		
<i>Juncus bufonius</i>	toad rush		0.02	
<i>Juncus effusus</i>	common rush		0.02	
<i>Juncus occidentalis</i>	western rush	0.004	0.02	
<i>Madia elegans</i>	common madia	0.15		
<i>Madia glomerata</i>	mountain tarweed	0.40		
<i>Madia gracilis</i>	grassy tarweed	0.33		
<i>Potentilla gracilis</i>	slender cinquefoil	0.25		
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	0.67		
<i>Rumex salicifolius</i>	willow dock	0.001		
<i>Sidalcea campestris</i>	meadow checkermallow	0.38		
<i>Solidago lepida</i> var. <i>salebrosa</i>	western goldenrod	0.03		
	<b>Pounds per acre</b>	<b>4.64</b>	<b>2.43</b>	<b>18.51</b>
	<b>Total pounds</b>	<b>70.92</b>	<b>4.86</b>	<b>109.21</b>

**Table B5.** Native seed broadcast at Champoege State Heritage Area in fall 2018.

Scientific name	Common name	Pounds/acre		
		Upland 1 acre	Swale 2.5 acres	Grass 1.5 acres
<i>Achillea millefolium</i>	common yarrow	0.09		
<i>Camassia leichtlinii</i> var. <i>suksdorfii</i>	large camas	1.83		
<i>Carex densa</i>	dense sedge		0.07	
<i>Carex feta</i>	greensheath sedge		0.18	
<i>Carex pachystachya</i>	chamisso sedge		0.14	
<i>Carex scoparia</i>	broom sedge		0.15	
<i>Carex stipata</i>	awlfruit sedge		0.17	
<i>Carex tumulicola</i>	splitawn sedge		0.81	
<i>Carex unilateralis</i>	lateral sedge		0.26	
<i>Collinsia grandiflora</i>	giant blue eyed Mary	0.45		
<i>Collomia grandiflora</i>	grand collomia	1.61		
<i>Danthonia californica</i>	California oatgrass	2.89		*
<i>Deschampsia cespitosa</i>	tufted hairgrass			*
<i>Eleocharis ovata</i>	ovoid spikerush		0.13	
<i>Elymus glaucus</i>	blue wildrye			*
<i>Eriophyllum lanatum</i>	common woolly sunflower	0.11		
<i>Festuca roemerii</i>	Roemer's fescue	1.05		*
<i>Gilia capitata</i>	bluehead gilia	0.19		
<i>Hordeum brachyantherum</i>	meadow barley			*
<i>Juncus bufonius</i>	toad rush		0.02	
<i>Juncus effusus</i>	common rush		0.02	
<i>Juncus occidentalis</i>	western rush		0.01	
<i>Perideridia gairdneri</i>	Gairdner's yampah	0.15		
<i>Perideridia oregana</i>	Oregon yampah	0.30		
<i>Potentilla gracilis</i>	slender cinquefoil	0.14		
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	0.49		
<i>Schoenoplectus tabernaemontani</i>	softstem bulrush		0.44	
<i>Scirpus microcarpus</i>	panicked bulrush		0.11	
	<b>Pounds per acre</b>	<b>9.31</b>	<b>2.51</b>	<b>17.18</b>
	<b>Total pounds</b>	<b>9.31</b>	<b>6.27</b>	<b>25.77</b>

**Table B6.** Native plants planted at Champoeg State Heritage Area in fall 2018 and 2019.

Scientific Name	Common name	Type	Number of plants per year	
			2018	2019
<i>Allium amplexans</i>	narrowleaf onion	bulb	400	450
<i>Brodiaea elegans</i>	harvest brodiaea	bulb		500
<i>Calochortus tolmiei</i>	Tolmie star-tulip	bulb	600	500
<i>Camassia leichtlinii</i>	large camas	bulb	1300	500
<i>Fragaria virginiana</i>	Virginia strawberry	bareroot	1400	1000
<i>Geranium oregonum</i>	Oregon geranium	bareroot	200	200
<i>Iris tenax</i>	toughleaf iris	bareroot	700	500
<i>Juncus effusus</i>	common rush	bareroot	550	
<i>Lomatium nudicaule</i>	barestem biscuitroot	bareroot	350	300
<i>Perideridia gairdneri</i>	Gairdner's yampah	bareroot	800	
<i>Triteleia hyacinthina</i>	white brodiaea	bulb	500	400
<i>Wyethia angustifolia</i>	California compassplant	bareroot	300	250
<b>Total</b>			<b>7100</b>	<b>4600</b>

**Table B7.** Trees and shrubs planted at Champoeg State Heritage Area in February 2019.

Scientific Name	Species	Growth Form	Number of bare-root plants	Number of live stakes	Total stems/acre	Total stems for 2.8 acre
<i>Acer macrophyllum</i>	bigleaf maple	Tree	162	-	58	162
<i>Amelanchier alnifolia</i>	Saskatoon serviceberry	Shrub	420	-	150	420
<i>Cornus sericea</i>	redosier dogwood	Shrub	420	140	200	560
<i>Fraxinus latifolia</i>	Oregon ash	Tree	200	-	71	200
<i>Holodiscus discolor</i>	oceanspray	Shrub	420	-	150	420
<i>Mahonia aquifolium</i>	Oregon grape	Shrub	420	-	150	420
<i>Oemleria cerasiformis</i>	Indian plum	Shrub	420	-	150	420
<i>Physocarpus capitatus</i>	Pacific ninebark	Shrub	340	280	221	620
<i>Populus trichocarpa</i>	black cottonwood	Tree	420	-	150	420
<i>Quercus garryana</i>	Oregon white oak	Tree	280	-	100	280
<i>Rhamnus purshiana</i>	cascara	Shrub	280	-	100	280
<i>Salix lucida ssp. lasiandra</i>	Pacific willow	Shrub	140	400	193	540
<i>Salix hookeriana</i>	dune willow	shrub	-	400	143	400
<i>Salix scouleriana</i>	Scouler's willow	Shrub	140	-	50	140
<i>Salix sitchensis</i>	Sitka willow	Shrub	140	280	150	420
<b>Total</b>			<b>4202</b>	<b>1500</b>	<b>2036</b>	<b>5702</b>



**Table B8.** Native seed sown at Thompson in November 2019.

Scientific name	Common name	Pounds
<i>Achillea millefolium</i>	common yarrow	0.23
<i>Bromus sitchensis</i>	Alaska brome	6.90
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell to spring	0.32
<i>Collinsia grandiflora</i>	giant blue eyed Mary	0.21
<i>Collomia grandiflora</i>	grand collomia	0.81
<i>Danthonia californica</i>	California oatgrass	3.50
<i>Elymus glaucus</i>	blue wildrye	2.99
<i>Epilobium densiflorum</i>	denseflower willowherb	0.12
<i>Eriophyllum lanatum</i>	woolly sunflower	0.08
<i>Festuca roemerii</i>	Roemer's fescue	0.65
<i>Juncus occidentalis</i>	western rush	0.00
<i>Madia gracilis</i>	grassy tarweed	0.32
<i>Plectritis congesta</i>	shortspur seablush	0.10
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	0.33
<i>Sidalcea malviflora</i> ssp. <i>virgata</i>	dwarf checkerbloom	0.49
<b>Total</b>		<b>17.05</b>

**Table B9.** Native species planted at Thompson in November 2019.

Scientific Name	Common name	Type	Number
<i>Allium amplexans</i>	narrowleaf onion	bulb	300
<i>Brodiaea elegans</i>	harvest brodiaea	bulb	400
<i>Calochortus tolmiei</i>	Tolmie star-tulip	bulb	400
<i>Camassia leichtlinii</i> var. <i>suksdorfii</i>	large camas	bulb	500
<i>Fragaria virginiana</i>	Virginia strawberry	bareroot	500
<i>Geranium oregonum</i>	western geranium	crown	100
<i>Iris tenax</i>	toughleaf iris	bareroot	400
<i>Perideridia gairdneri</i> ssp. <i>borealis</i>	Gairdner's yampah	bareroot	400
<i>Sidalcea campestris</i>	meadow checkermallow	bareroot	300
<i>Triteleia hyacinthina</i>	white brodiaea	bulb	500
<i>Wyethia angustifolia</i>	California compassplant	crown	200
<b>Total</b>			<b>4000</b>

## Appendix C1. Absolute vegetation cover (%) of plant species observed in 5x5m plots at Herbert Farm and Natural Area in 2022.

Species	Growth Habit	Origin	Phase I			Phase II	
			Upland prairie 2 acres	Upland prairie 38 acres		Upland prairie 15 acres	
			Plot 1	Plot 2	Plot 3	Plot 4	Plot 5
<i>Anagallis arvensis</i>	Forb	introduced			0.5		
<i>Crepis sp.</i>	Forb	introduced	0.1	0.5	0.5	0.1	0.1
<i>Daucus carota</i>	Forb	introduced	15	0.1			
<i>Galium parisiense</i>	Forb	introduced	0.1	0.1	0.5	2	0.5
<i>Geranium dissectum</i>	Forb	introduced		0.1	0.1		
<i>Hypericum perforatum</i>	Forb	introduced		0.1	0.5	1	0.5
<i>Kickxia elatine</i>	Forb	introduced				0.5	
<i>Lactuca sp.</i>	Forb	introduced			0.1	0.1	0.1
<i>Leucanthemum vulgare</i>	Forb	introduced	4				
<i>Myosotis discolor</i>	Forb	introduced		0.1			
<i>Plantago lanceolata</i>	Forb	introduced	15				
<i>Rumex crispus</i>	Forb	introduced					0.5
<i>Senecio jacobaea</i>	Forb	introduced		0.1			
<i>Trifolium dubium</i>	Forb	introduced	0.1				
<i>Vicia cracca</i>	Forb	introduced	0.1	0.1	0.5		
<i>Vicia hirsuta</i>	Forb	introduced	0.1				
<i>Vicia sativa</i>	Forb	introduced	0.1				
<i>Vicia tetrasperma</i>	Forb	introduced	0.1	0.1	3		
<i>Achillea millefolium</i>	Forb	native	0.5	0.1	2		0.1
<i>Acmispon americanum</i>	Forb	native		6	0.1	1	
<i>Balsamorhiza sp.</i>	Forb	native	0.1				
<i>Brodiaea elegans</i>	Forb	native	0.1				
<i>Calochortus tolmiei</i>	Forb	native	0.1				
<i>Camassia sp.</i>	Forb	native		0.5	0.1		0.1
<i>Castilleja levisecta</i>	Forb	native	0.1				
<i>Clarkia sp.</i>	Forb	native	0.5	0.1	0.1		
<i>Collinsia grandiflora</i>	Forb	native	0.1				
<i>Collomia grandiflora</i>	Forb	native	0.1	0.1	0.1		
<i>Dichelostemma congestum</i>	Forb	native	0.1				
<i>Eriophyllum lanatum</i>	Forb	native	0.1	18	25		25
<i>Fragaria virginiana</i>	Forb	native	4				
<i>Lupinus bicolor</i>	Forb	native	0.1				
<i>Lupinus oregonus</i>	Forb	native	1				
<i>Madia sp.</i>	Forb	native	0.1	0.1			
<i>Microsteris gracilis</i>	Forb	native				0.5	
<i>Navarretia sp.</i>	Forb	native	10				0.1
<i>Plectritis ciliosa</i>	Forb	native	0.1				

## Plants for People Phase I &amp; II: 2022 Post-Implementation Report

Species	Growth Habit	Origin	Phase I			Phase II	
			Upland prairie 2 acres	Upland prairie 38 acres		Upland prairie 15 acres	
			Plot 1	Plot 2	Plot 3	Plot 4	Plot 5
<i>Potentilla gracilis</i>	Forb	native		3	1	5	20
<i>Prunella vulgaris ssp. lanceolata</i>	Forb	native	0.5	1	0.1	7	80
<i>Sidalcea campestris</i>	Forb	native	0.5				
<i>Sidalcea malviflora ssp. virgata</i>	Forb	native		1	5	0.5	8
<i>Sisyrinchium sp.</i>	Forb	native				0.1	0.5
<i>Agrostis capillaris</i>	Graminoid	introduced	10		1		
<i>Aira caryophyllea</i>	Graminoid	introduced	8				
<i>Alopecurus pratensis</i>	Graminoid	introduced			0.1		
<i>Briza minor</i>	Graminoid	introduced	1				
<i>Bromus hordeaceus</i>	Graminoid	introduced	0.1	18	0.1		
<i>Holcus lanatus</i>	Graminoid	introduced	0.1	4			
<i>Poa pratensis</i>	Graminoid	introduced		0.1			0.5
<i>Vulpia sp.</i>	Graminoid	introduced	0.1		4	10	8
<i>Bromus carinatus</i>	Graminoid	native	0.5				
<i>Carex feta</i>	Graminoid	native				0.5	1
<i>Danthonia californica</i>	Graminoid	native	0.1		1	0.1	1
<i>Elymus glaucus</i>	Graminoid	native		20	4		
<i>Festuca roemerii</i>	Graminoid	native	2	60	75	80	0.1
<i>Juncus sp</i>	Graminoid	native				0.5	
<i>Crataegus monogyna</i>	Woody	introduced		1	0.1		
<i>Prunus sp.</i>	Woody	introduced	0.5				
<i>Rosa sp.</i>	Woody	native	1				
<i>Symphoricarpos albus</i>	Woody	native	1				
<i>Toxicodendron diversilobum</i>	Woody	native	1				
<i>Quercus garryana</i>	Woody	native	0.1				
UNK Apiaceae			0.1				
Litter			15	NA	25	30	25
Bare soil			25	NA	0.5	1	0.5
Moss			25	NA	0	0.5	0
Basal Area			35	NA	75	74	75
<b>Native</b>			<b>23.8</b>	<b>109.9</b>	<b>113.5</b>	<b>95.2</b>	<b>135.9</b>
<b>Introduced</b>			<b>54.5</b>	<b>24.4</b>	<b>11</b>	<b>13.7</b>	<b>10.2</b>
<b>Woody</b>			<b>3.7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Appendix C2. Vegetation cover (%) of plants observed in 1x1m plots at Thompson in 2022.

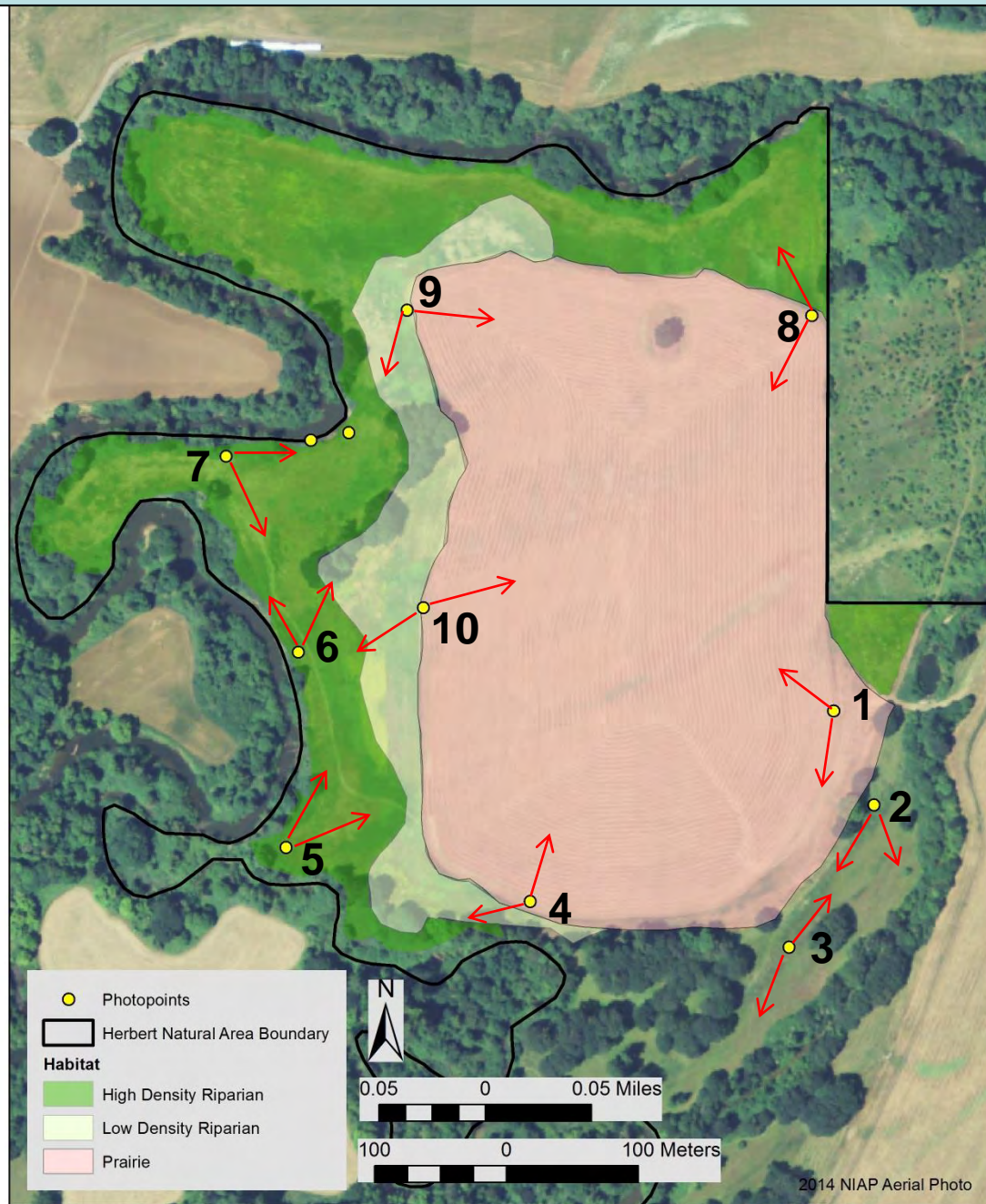
Species	Growth Habit	Origin	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5
<i>Bellardia viscosa</i>	Forb	Introduced	0	15	2	0	0
<i>Narcissus pseudonarcissus</i>	Forb	Introduced	0	3	0	0	0
<i>Plantago lanceolata</i>	Forb	Introduced	10	3	0	3	2
<i>Rumex acetosella</i>	Forb	Introduced	10	5	1	0	0
<i>Sherardia arvensis</i>	Forb	Introduced	1	1	3	0	0
<i>Tanacetum vulgare</i>	Forb	Introduced	0	1	0	0	0
<i>Taraxacum officinale</i>	Forb	Introduced	0	0	2	0	1
<i>Vicia hirsuta</i>	Forb	Introduced	<1	<1	0	0	0
<i>Daucus carota</i>	Forb	Invasive	4	2	0	0	0
<i>Leucanthemum vulgare</i>	Forb	Invasive	4	5	0	1	0
<i>Achillea millefolium</i>	Forb	Native	5	4	1	2	2
<i>Allium amplexans</i>	Forb	Native	0	0	1	0	0
<i>Calochortus tolmiei</i>	Forb	Native	0	0	2	0	2
<i>Camassia leichtlinii</i>	Forb	Native	4	4	0	0	0
<i>Centaureum muehlenbergii</i>	Forb	Native	0	1	0	1	0
<i>Clarkia amoena</i>	Forb	Native	<1	<1	0	<1	0
<i>Collinsia grandiflora</i>	Forb	Native	<1	<1	<1	1	<1
<i>Collomia grandiflora</i>	Forb	Native	1	1	1	1	0
<i>Eriophyllum lanatum</i>	Forb	Native	10	8	5	5	30
<i>Fragaria virginiana</i>	Forb	Native	1	3	1	5	3
<i>Geum macrophyllum</i>	Forb	Native	2	0	0	0	0
<i>Iris tenax</i>	Forb	Native	0	0	1	0	0
<i>Lomatium nudicaule</i>	Forb	Native	1	1	0	0	0
<i>Madia glomerata</i>	Forb	Native	20	15	25	35	5
<i>Plectritis congesta</i>	Forb	Native	1	3	1	3	0
<i>Pteridium aquilinum</i>	Forb	Native	0	0	5	0	0
<i>Ranunculus occidentalis</i>	Forb	Native	2	<1	1	1	1
<i>Rupertia physodes</i>	Forb	Native	0	0	2	3	0
<i>Sidalcea malviflora</i>	Forb	Native	5	5	2	3	1
<i>Wyethia angustifolia</i>	Forb	Native	2	1	1	2	1
<i>Agrostis capillaris</i>	Graminoid	Introduced	10	20	15	10	40
<i>Alopecurus pratensis</i>	Graminoid	Introduced	3	1	0	0	2
<i>Anthoxanthum odoratum</i>	Graminoid	Introduced	2	0	0	0	2
Bare ground			9	0	20	15	0
Litter			0	0	10	9	8
Moss			0	0	0	0	0
Total			107	102	102	100	100
<b>Native</b>			<b>54</b>	<b>46</b>	<b>49</b>	<b>62</b>	<b>45</b>
<b>Introduced</b>			<b>36</b>	<b>49</b>	<b>23</b>	<b>13</b>	<b>47</b>

**Appendix D. Photo point summary at Plants for People project sites (2013-2022)**

Location of Plants for People (Phase I and Phase II photo points; projection NAD 1983 UTM Zone 10N) and the directions that photographs are taken.

Project Site	Photo point	Latitude	Longitude	Photographs directions (degrees)	Project Site	Photo point	Latitude	Longitude	Photographs directions (degrees)
Herbert Farm	1	44.521444	123.295944	186, 284	Champoeg	B	45.2537	-122.89	282
Herbert Farm	2	44.520806	123.295556	210, 158	Champoeg	C & D	45.2542	-122.89	340, 23
Herbert Farm	3	44.519833	123.296361	28, 217	Champoeg	E	45.2554	-122.89	99
Herbert Farm	4	44.520139	123.298833	12, 260	Rattlesnake Butte	1	44.2625	-123.32	0, 90, 180, 270
Herbert Farm	5	44.5205	123.301167	24, 75	Rattlesnake Butte	2	44.2642	-123.33	0, 90, 180, 270
Herbert Farm	6	44.521833	123.301056	320, 17	Rattlesnake Butte	3	44.2634	-123.33	0, 90, 180, 270
Herbert Farm	7	44.523167	123.30175	90, 165	South Yamhill	1	45.0526	-123.58	0, 90, 180, 270
Herbert Farm	8	44.524139	123.296167	225, 326	South Yamhill	3	45.0516	-123.58	0, 90, 180, 270
Herbert Farm	9	44.524167	123.300028	200, 95	South Yamhill	5	45.0521	-123.58	0, 90, 180, 270
Herbert Farm	10	44.522139	123.299861	346, 80	Thompson	1	45.0638	-123.62	0, 90, 180, 270
Herbert Farm	13	44.522015	-123.290778	210,255	Thompson	2	45.0631	-123.62	0, 90, 180, 270
Herbert Farm	14	44.519009	-123.295266	25, 80					
Herbert Farm	15	44.518323	-123.296837	0, 90, 180, 270					
Herbert Farm	16	44.517308	-123.298805	0, 90, 180, 270					

# Herbert Farm & Natural Area photo points 1-10 (Plants for People Phase I)



Red arrows indicate approximate direction that photos were taken

# Photo point 1

1 (186°): Pre-restoration, after  
ryegrass was harvested,  
June 28, 2013



1 (186°): Phase I project completion, after  
second seeding of prairie forbs & grasses in  
2015; May 31, 2016



1 (186°): Post-implementation, after  
prescribed burn and seeding in 2017;  
June 5, 2020



1 (186°): Post-implementation,  
June 1, 2022





## Photo point 1

1(284°): Pre-restoration, ryegrass field,  
April 24, 2013



1 (284°): Phase I project completion,  
after second seeding of prairie forbs &  
grasses in 2015; May 31, 2016



1 (284°): Post-implementation, after  
prescribed burn and seeding in 2017;  
June 5, 2020



1 (284°): Post-implementation,  
June 1, 2022



## Photo point 2

2 (210°): Pre-restoration, reed canary-grass in foreground,  
May 10, 2013



2 (210°): Phase I project completion,  
after seeding forbs & grasses in 2015;  
May 31, 2016



2 (210°): Post-implementation,  
June 5, 2020



2 (210°): Post-implementation, after  
prescribed burn and seeding in 2021;  
June 1, 2022



## Photo point 2

2 (158°): After one year treatment,  
April 15, 2014



2 (158°): Phase I project completion, after  
seeding with native forbs & grasses in 2015;  
May 31, 2016



2 (158°): Post-implementation,  
June 5, 2020



2 (158°): Post-implementation, after  
prescribed burn and seeding in 2021;  
June 1, 2022



## Photo point 3

3 (28°): Pre-restoration, mowed swale,  
September 18, 2012



3 (28°): Phase I project completion, after  
seeding with native forbs & grasses in 2015;  
May 31, 2016



3 (28°): Post-implementation,  
June 5, 2020



3 (28°): Post-implementation, after  
prescribed burn and seeding in 2021;  
June 1, 2022



## Photo point 3

3 (217°): After spot spraying,  
April 15, 2014



3 (217°): Project completion, after seeding  
with native forbs & grasses in 2015;  
May 31, 2016



3 (217°): Post-implementation,  
June 5, 2020



3 (217°): Post-implementation, after  
prescribed burn and seeding in 2021;  
June 1, 2022



## Photo point 4

4 (12°): After 1 year site treatment,  
April 15, 2014



4 (12°): Project completion, after 2<sup>nd</sup> year  
of seeding forbs and grasses, May 31,  
2016



4 (12°): Post-implementation, after  
prescribed burn and seeding in 2017;  
June 5, 2020



4 (12°): Post-implementation,  
June 1, 2022



## Photo point 4

4 (260°): Pre-restoration, fallow grassland, April 24, 2013



4 (260°): Phase I project completion, after seeding & 2<sup>nd</sup> year of planting riparian trees & shrubs, May 31, 2016



4 (260°): Post-implementation, June 5, 2020



4 (260°): Post-implementation, June 1, 2022



## Photo point 5

5 (24°): Pre-treatment – blackberry in riparian margin, April 24, 2013



5 (24°): Project completion, after seeding & 2<sup>nd</sup> year of planting riparian trees & shrubs, May 31, 2016



5 (24°): Post-implementation, June 5, 2020



5 (24°): Post-implementation, June 1, 2022





## Photo point 5

5 (75°): after one year of site preparation, April 15, 2014



5 (75°): Project completion, after seeding & 2<sup>nd</sup> year of planting riparian trees & shrubs, May 31, 2016



5 (75°): Post-implementation, June 5, 2020



5 (75°): Post-implementation, June 1, 2022



## Photo point 6

6 (320°): Mowed blackberry & reed  
canarygrass, June 6, 2013



6 (320°): Project Completion, after  
seeding & 2<sup>nd</sup> year of planting  
riparian trees & shrubs, May 31, 2016



6 (320°): Post-implementation,  
June 5, 2020



6 (320°): Post-implementation,  
June 1, 2022



## Photo point 6

6 (17°): After one year site preparation, April 15, 2014



6 (17°): Project Completion, after seeding & 2<sup>nd</sup> year of planting riparian trees & shrubs, May 31, 2016



6 (17°): Post-implementation, June 5, 2020



6 (17°): Post-implementation, June 1, 2022



## Photo point 7

7 (90°): Pre-treatment – blackberry,  
September 13, 2013



7 (90°): Project completion, after  
seeding & 2<sup>nd</sup> year of planting  
riparian trees & shrubs, May 31, 2016



7 (90°): Post-implementation,  
June 5, 2020



7 (90°): Post-implementation,  
June 1, 2022



## Photo point 7

7 (165°): Fallow grassland after 1 year site preparation, April 15, 2014



7 (165°): Project completion, after seeding & 2<sup>nd</sup> year of planting riparian trees & shrubs, May 31, 2016



7 (165°): Post-implementation, June 5, 2020



7 (165°): Post-implementation, June 1, 2022



## Photo point 7

7 (90°): Pre-treatment – blackberry,  
September 13, 2013



7 (90°): Project completion, after  
seeding & 2<sup>nd</sup> year of planting  
riparian trees & shrubs, May 31, 2016



7 (90°): Post-implementation,  
June 5, 2020



7 (90°): Post-implementation,  
June 1, 2022



## Photo point 7

7 (165°): Fallow grassland after 1 year site preparation, April 15, 2014



7 (165°): Project completion, after seeding & 2<sup>nd</sup> year of planting riparian trees & shrubs, May 31, 2016



7 (165°): Post-implementation, June 5, 2020



7 (165°): Post-implementation, June 1, 2022



## Photo point 8

8 (225°): Pre-treatment – ryegrass field, April 24, 2013



8 (225°): Project completion, after 2<sup>nd</sup> year of seeding forbs and grasses, May 31, 2016



8 (225°): Post-implementation, after prescribed burn and seeding in 2017, June 5, 2020



8 (225°): Post-implementation, June 1, 2022





## Photo point 8

8 (326°): After 1 year site preparation, April 15, 2014



8 (326°): Project completion, after seeding & 2<sup>nd</sup> year of planting riparian trees & shrubs, May 31, 2016



8 (326°): Post-implementation, June 5, 2020



8 (326°): Post-implementation, June 1, 2022



## Photo point 9

9 (200°): After 2 years of site prep  
and 1<sup>st</sup> year tree planting,  
April 21, 2015



9 (200°): Project completion, after  
seeding & 2<sup>nd</sup> year of planting  
riparian trees & shrubs, May 31, 2016



9 (200°): Post-implementation.  
June 5, 2020



9 (200°): Post-implementation.  
June 1, 2022



## Photo point 9

9 (95°): After 2 years site prep and first forb seeding, 21 April 2015



9 (95°): Project completion, after 2<sup>nd</sup> year of seeding forbs and grasses, May 31, 2016



9 (95°): Post-implementation. After prescribed burn and seeding in 2017; June 5, 2020



9 (95°): Post-implementation. June 1, 2022



## Photo point 10

10 (346°): After 2 years site prep and 1st year planting trees, April 21, 2014



10 (346°): Project completion, after seeding & 2<sup>nd</sup> year of planting riparian trees & shrubs, May 31, 2016



10 (346°): Post-implementation.  
June 5, 2020



10 (346°): Post-implementation.  
June 1, 2022



# Photo point 10

10 (80°): After first year sowing native forbs, April 21, 2015



10 (80°): Project completion, after 2<sup>nd</sup> year of seeding forbs and grasses, May 31, 2016



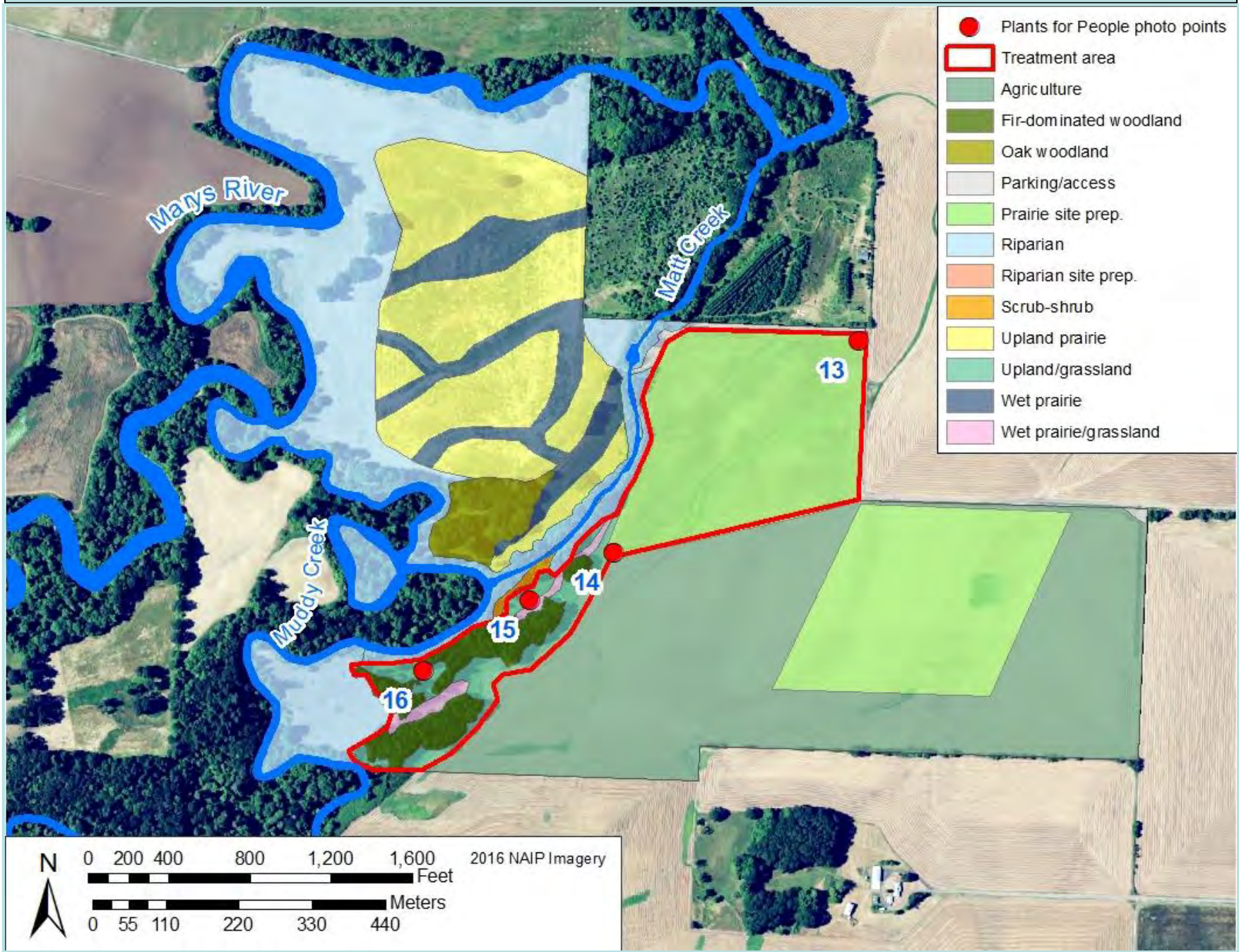
10 (80°): Post-implementation. After prescribed burn and seeding in 2017; June 5, 2020



10 (80°): Post-implementation. June 1, 2022



# Herbert Farm and Natural Area photo points 13-16 (Plants for People Phase II)



## Herbert Farm photo point 13

13 (210°): Before site preparation,  
May 24, 2017



13 (210°): After broadcast herbicide  
treatments and seeding with native  
species in fall 2018; June 4, 2019



13 (210°): Post-implementation, after  
second seeding in fall 2019 and spot  
spray treatments; June 1, 2022



13 (255°): Before site preparation,  
May 24, 2017



13 (255°): After broadcast herbicide  
treatments and seeding with native  
species in fall 2018, June 4, 2019



13 (255°): Post-implementation, after  
second seeding in fall 2019 and spot  
spray treatments; June 1, 2022



# Herbert Farm photo point 14

14 (25°): Before site preparation, May 24, 2017



14 (25°): After broadcast herbicide treatments and seeding with native species in fall 2018, June 4, 2019



14 (25°): Post-implementation, after second seeding in fall 2019 and spot spray treatments; June 1 2022



14 (80°): Before site preparation, May 24, 2017



14 (80°): After broadcast herbicide treatments and seeding with native species in fall 2018, June 4, 2019



14 (80°): Post-implementation, after second seeding in fall 2019 and spot spray treatments; June 1, 2022





# Herbert Farm photo point 15

15 (60°): Before site preparation,  
March 3, 2018



15 (60°): After broadcast herbicide  
treatments, June 4, 2019



15 (65°): Post-implementation, after  
seeding in 2020-21 and spot spray  
treatments; June 1, 2022



15 (180°): Before site preparation,  
June 6, 2018



15 (180°): After Douglas-fir removal  
and broadcast herbicide treatments,  
June 4, 2019



15 (180°): Post-implementation, after  
seeding in 2020-21 and spot spray  
treatments; June 1, 2022



## Herbert Farm photo point 16

16 (180°): Before site preparation,  
March 3, 2018



16 (180°): After Douglas-fir clearing  
and broadcast herbicide treatments;  
June 4, 2019



16 (180°): Post-implementation, after  
tree & shrub planting in 2020-21 and  
spot spray treatments; June 1, 2022



16 (270°): Before site preparation,  
June 6, 2018



16 (270°): After Douglas-fir removal  
and broadcast herbicide treatments;  
June 4, 2019



16 (270°): Post-implementation, after  
tree & shrub planting in 2020-21 and  
spot spray treatments; June 1, 2022



# Location of photo points at Champoeg State Heritage Area



## Champoeg photo point B

B (282°): Pre-restoration, before forb introduction plot creation, August 2013



B (282°): Completion of Phase I and before start of Phase II; plant establishment in forb plot D and after mowing, August 11, 2016



B (282°): Completion of Phase II, June 6, 2019



B (285°): Post-implementation, May 7, 2022



# Champoeg photo point C

C (10°): Pre-restoration, before herbicide treatments, May 2014



C (10°): Completion of Phase I and before start of Phase II; after herbicide treatments, August 11, 2016



C (10°): Completion of Phase II, June 6, 2019



C (10°): Post-implementation, May 7, 2022



# Champoeg Photo point D

D (23°): Pre-restoration, meadow with tufted hairgrass, August 2013



D (320°): Completion of Phase I and before start of Phase II; after herbicide treatments, August 11, 2016



D (320°): Project completion, June 6, 2019



D (320°): Post-implementation, May 7, 2022



# Champoeg Photo point E

D (23°): Pre-treatment. Meadow with tufted hairgrass, August 2013



E (70°): Completion of Phase I and before start of Phase II; plant establishment in forb plot A, May 2016



E (70°): Project completion, June 6, 2019



E (70°): Post-implementation, May 7, 2022



# Location of photo points at Rattlesnake Butte





# Rattlesnake Butte photo point 1

1 (0°): July 5, 2017



1 (0°): After tree removal, June 4, 2019



1 (0°): Post-implementation, May 11, 2022



1 (90°): July 5, 2017



1 (90°): After tree removal, June 4, 2019



1 (90°): Post-implementation, May 11, 2022



## Rattlesnake Butte photo point 2

2 (90°): July 5, 2017



2 (90°): After tall oat grass control,  
June 4, 2019



2 (90°): Post-implementation,  
May 11, 2022



2 (180°): July 5, 2017



2 (180°): After tall oat grass control,  
June 4, 2019



2 (180°): Post-implementation,  
May 11, 2022



# Rattlesnake Butte photo point 3

3 (0°): July 5, 2017



3 (0°): After tree removal and tall oat grass control, June 4, 2019



3 (0°): Post-implementation, May 11, 2022



3 (90°): July 5, 2017



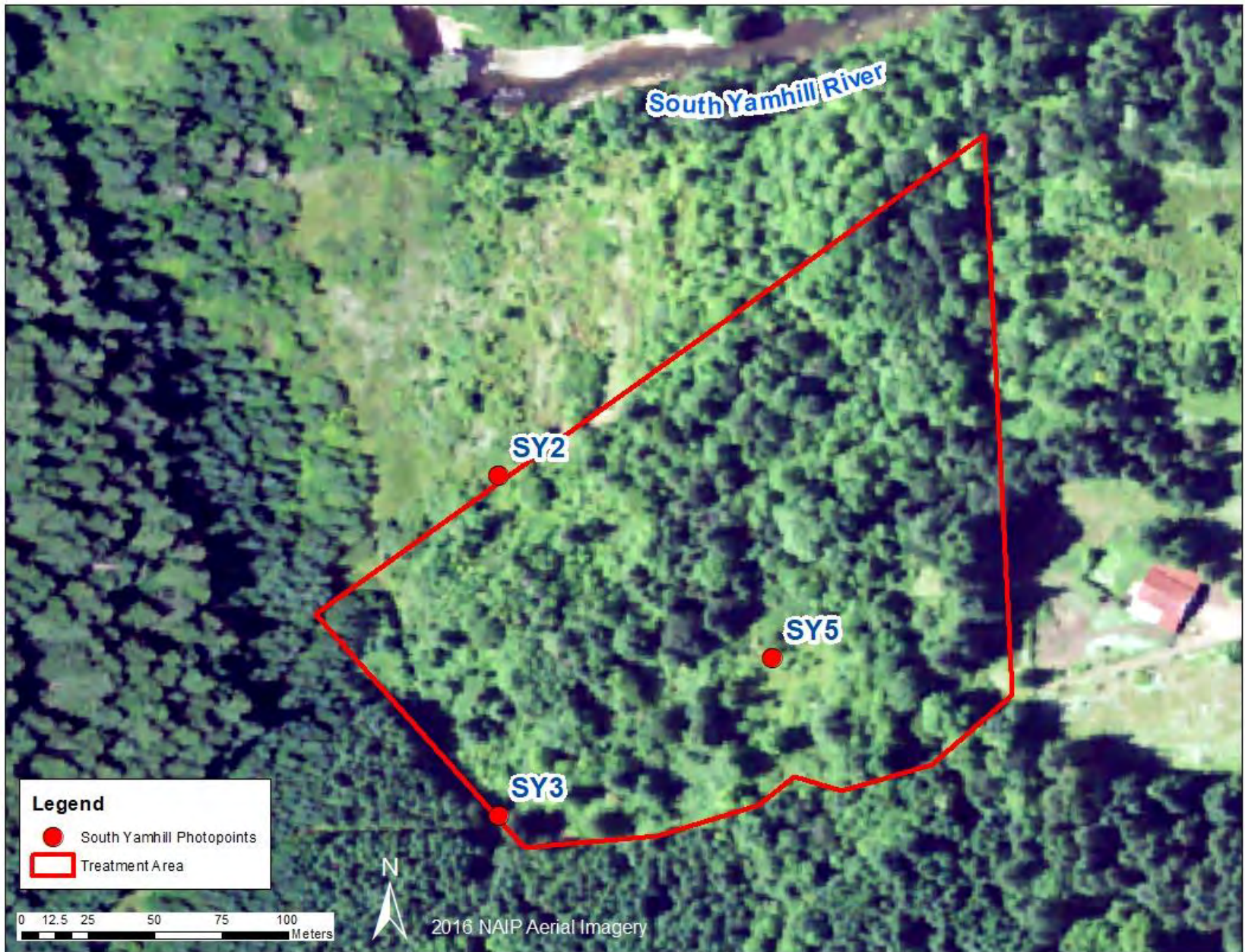
3 (90°): After tree removal and tall oat grass control, June 4, 2019



3 (90°): Post-implementation, May 11, 2022



# Location of photo points at South Yamhill



## South Yamhill photo point 2

2 (90°): September 6, 2017



2 (90°): After shrub removal, weed control and ground cover established, May 30, 2019



2 (90°): Post-implementation, June 9, 2022



2 (180°): September 6, 2017



2 (180°): After shrub removal, weed control and ground cover established, May 30, 2019



2 (180°): Post-implementation, June 9, 2022



## South Yamhill photo point 3

3 (0°): September 6, 2017



3 (0°): After shrub removal, weed control and ground cover established, May 30, 2019



3 (0°): Post-implementation, June 9, 2022



3 (90°): September 6, 2017



3 (90°): After shrub removal, weed control and ground cover established, May 30, 2019



3 (90°): Post-implementation, June 9, 2022



## South Yamhill photo point 5

5 (180°): September 6, 2017



5 (180°): After shrub removal, weed control and ground cover established, May 30, 2019



5 (180°): Post-implementation, June 9, 2022



5 (270°): September 6, 2017



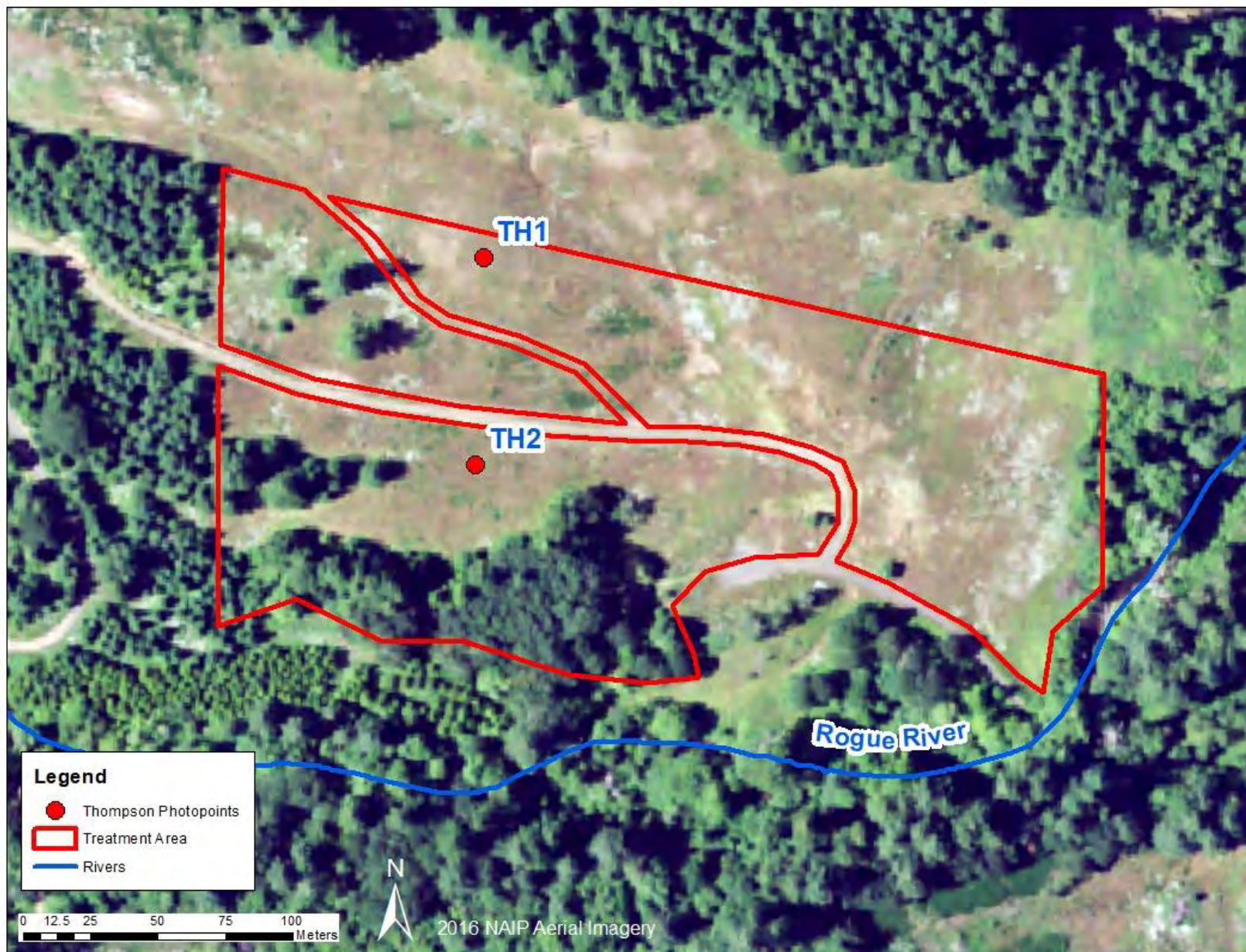
5 (270°): After shrub removal, weed control and ground cover established, May 30, 2019



5 (270°): Post-implementation, June 9, 2022



# Location of photo points at Thompson





# Thompson photo point 1

1 (180°): July 6, 2017



1 (180°): After mowing and weed control, May 30, 2019



1 (180°): Post-implementation, June 9, 2022



1 (270°): September 6, 2017



1 (270°): After mowing and weed control, May 30, 2019



1 (270°): Post-implementation, June 9, 2022



## Thompson photo point 2

2 (90°): July 6, 2017



2 (90°): After mowing and weed control, May 30, 2019



2 (90°): Post-implementation, June 9, 2022



2 (270°): September 6, 2017



2 (270°): After mowing and weed control, May 30, 2019



2 (270°): Post-implementation, June 9, 2022

